ABSTRACT

STRETCH, LORIANN SYKES. Noncognitive Variables Predicting Academic Success and Persistence for African-American Freshmen Attending Historically Black Colleges and Universities versus African-American Freshmen Attending Predominantly White Institutions. (Under the direction of Siu-Man Raymond Ting.)

Limited research is available when attempting to determine what, if any, differences exist in predicting academic success and persistence for African-American students attending a historically Black college or university (HBCU) versus a predominantly White institution (PWI). Tracey and Sedlacek's (1984) noncognitive variables have accurately predicted academic success and persistence for African-American students. However, in this study, the majority of the noncognitive variables as measured by the NCQ did not differ significantly between the PWI (n=58) and the HBCU (n=538). The interaction term of Positive Self-Concept and institution type did differ for academic success and was significant for African-American students at the PWI. Similarly, Knowledge Acquired in a Field and Successful Leadership Positions differed for college persistence between the two institution types and was significant for African-American students at the PWI. Although the majority of noncognitive variables did not assist in determining the second semester GPA or enrollment status of African-American students at either a PWI or a HBCU, past research has clearly demonstrated that the significance of noncognitive variables differs from semester to semester. Therefore, a more comprehensive longitudinal study examining multiple PWIs and HBCUs is needed to fully understand what, if any, differences there are in the way noncognitive or psychosocial variables predict academic success and persistence at a PWI versus a HBCU.

NONCOGNITIVE VARIABLES PREDICTING ACADEMIC SUCCESS AND PERSISTENCE FOR AFRICAN-AMERICAN FRESHMEN ATTENDING HISTORICALLY BLACK COLLEGES AND UNIVERSITIES VERSUS AFRICAN-AMERICAN FRESHMEN ATTENDING PREDOMINANTLY WHITE INSTITUTIONS

by

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A dissertation submitted to the Graduate Faculty of
North Carolina State University
In partial fulfillment of the
Requirements for the degree of
Doctor of Philosophy

COUNSELOR EDUCATION

Raleigh

2005

APPROVED BY:

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Chair of Advisory Committee

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DEDICATION

This work is dedicated to my loving husband, Jesse, who has supported me and pushed me to achieve this goal, and to my beloved son, Nathan, who was a blessed and wonderful surprise in the middle of my journey to my doctorate.

"Mommy's paper is done!"

BIOGRAPHY

LoriAnn Sykes Stretch grew up in beautiful southern Virginia and currently lives in Clayton, NC with her husband, Jesse, and son, Nathan. LoriAnn attended Longwood College, now Longwood University, in Farmville, VA. She graduated summa cum laude from Longwood in 1993 with a B.S. in Political Science with a concentration in pre-law and completed her Masters in Community and College Counseling in 1997.

LoriAnn has worked in a variety of settings including the House of Representatives, the Virginia Skyline Girl Scout Council, DOVES – a domestic violence shelter, the United Way, and the Virginia Department of Rehabilitative Services. LoriAnn also served as the Assistant Counseling Director, Coordinator of Disability Services at Meredith College for five years. In addition, she has provided disability services consulting to Saint Mary's School and Louisburg College. Currently, LoriAnn is the owner and lead counselor of Clayton Counseling Services, a large private practice, located in Clayton, NC.

LoriAnn's first love is teaching especially at the graduate level. She began teaching college courses in 1997. Since then, she has taught at the University of North Carolina – Chapel Hill, North Carolina State University, Meredith College, and Campbell University. LoriAnn enjoys teaching counseling as well as educational psychology courses.

LoriAnn is a Licensed Professional Counselor and National Certified Counselor. She is a member of Phi Kappa Phi, Pinnacle, and Alpha Lambda Delta. LoriAnn served as the President of the Nu Sigma Chi chapter of Chi Sigma Iota in 2003-2004. She is also a member of the American Counseling Association, the Association for Play Therapy, the Licensed Professional Counselors Association of NC as well as several other state and national organizations.

ACKNOWLEDGMENTS

First and foremost, I want to thank my husband and son for their patience and support during this process. I simply could not have finished, physically or emotionally, without your support.

Thank you to Dr. Siu-Man Raymond Ting for advising me and offering me the opportunity to work with him on his NCQ research. I have learned so much and have a much sounder understanding and appreciation for research. Dr. Stanley Baker, I know I have already told you but I respect you highly as a teacher and mentor. I am so appreciative of everything I was able to learn from you. Thanks as well to Dr. Ann Schulte who was always willing to be honest with me and pushed me to achieve the highest standard of learning. Also, thank you to Dr. Ed Gerler who stepped in to fill a spot on my committee. I have always appreciated your support and vote of confidence. I also need to thank Dr. Herbert Exum who convinced me to give up a seat in law school to pursue my Ph.D. Though I was full of doubt at times, I have no regrets now – thank you.

I need to also thank Dr. Peter Bloomfield with the Department of Statistics at NCSU. I sincerely appreciate the time and energy you invested in me when you had absolutely no obligation to me at all. I learned a tremendous amount from you and enjoyed working with you. A special thanks to Betsy Enstrom who served as a statistical consultant on my dissertation for one semester. I would have never mastered SAS without your help.

I must also thank my staff at Clayton Counseling Services. Lori, thank you for protecting me and assisting me whenever and where ever you could. You are an amazing woman and I thank God for you daily. Rachel, thank you for jumping in and helping me with, well, everything. I could not have completed this dissertation without you picking up

the slack elsewhere. Renee, thank you for picking up so many new cases and allowing me to take a step back. Thank you to everyone at Clayton Counseling Services for being such a great team.

Likewise, I need to thank the staff of the Meredith College Counseling Center who also supported me during this process. Beth, you are wonderful, and you allowed me to grow as a person and a professional – thank you for your trust and friendship. Angie, there is NO way I could have completed this dissertation without you. Thank you from the bottom of my heart. I hope I can someday begin to repay your kindness. Thank you for loving Nathan so much. Lynne, I have always respected you greatly and appreciate you listening to me and encouraging me. Betty-Shannon and Jill, thank you, for making it so easy for me to leave Disability Services after having invested so much in the program. I knew I was leaving the program in good hands.

In addition, I need to thank several people who instilled a tremendous love of reading and learning into me. My parents, especially my mother, gave me the greatest gift when they taught me to love to read and to wonder about the world. I must also thank Mrs. Ruby Archie, my 12th grade AP-English teacher, who refused to let me coast through her class and who held me accountable for every decision I made. I owe Mrs. Archie a huge debt of gratitude.

I must also thank my fellow students from whom I have learned a lot. I cannot acknowledge everyone but want to thank a select few who will hopefully remain lifelong friends: Shamshad Adyar, Heloisa Portela Myers, Russ Chapman, Song Lee, Chao-Hsuan Wu, Sharon Cannon, Elaine Harper, Marc Hardy, and Kyla Sawyer. Special thanks to Sharon Cannon for guiding me through the process and answering all my questions. To Russ,

Shamshad, and Heloisa, thank you for your encouragement and willingness to share your thoughts. You have all made me a better teacher, listener, and counselor. Last but not least, I must thank my dearest friend and colleague, Jane Griffiths, who has kindly listened and shared in my misery and joy.

To everyone else, thank you for your patience and understanding. You have all been wonderful, and I am looking forward to re-establishing a lot of friendships after five long years.

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CHAPTER 1

INTRODUCTION

Purpose of Study

Although most researchers and practitioners agree that academic performance should not be the only criteria used in admissions decisions, controversy continues about what other variables to consider and how much weight each variable should carry. Typically, the degree of correspondence between the predicted College Grade Point Average (CGPA) and the actual CGPA determines the predictive effectiveness of variables (Zwick, 2002). The standard variables utilized in predicting CGPA are SAT scores and high school grade point average (HSGPA). In regard to SAT scores, these scores are incomplete, subject to error, and provide little information about the assessed individuals (Zwick, 2002). In fact, "university officials have identified standardized admissions test as significant barriers to entry for thousands of academically qualified minority, first-generation, low-income and female college students" (Rooney, 1998, p. 1). A frequent argument about the SAT and other standardized admission tests is that these tests are of little help in identifying talented applicants with mediocre test scores nor are these tests useful in weighing diversity considerations against academic performance (Zwick, 2002). Zwick (2002) noted that "[s]tandardized admissions test scores tell us about only a fraction of a person's capabilities" (p. 72). Critics of standardized tests argue that such tests are racially and ethnically biased, do not reflect the true ability of certain student populations (Sedlacek, 2004; Sternberg, 1985; Zwick, 2002), do not predict success uniformly across gender and ethnic student groups (Bridgeman & Wendler, 1991; Farver, Sedlacek & Brooks, 1973; Sample & Seymour, 1971; Thomas & Stanley, 1969), do not add much to prediction beyond the use of HSGPA or rank

(Baron & Norman, 1992; Crouse, 1986; Hudson, 1993; Sedlacek, 1979), and predictability is not uniform for African-American students across different institutional settings (Carmicheal, Burke, Hunter, Labat, & Sevenair, 1986).

In fact, Robbins and Schwitzer (1988) found pre-college academic characteristics (e.g., standardized exams and HSGPA) to have relatively limited power in predicting academic and non-academic adjustment to college. In addition, Sample and Seymour (1971); Farver, Sedlacek and Brooks (1973); and Arbona and Novy (1990) noted that cognitive variables, such as standardized tests, may not be the best predictors and should be supplemented with other cognitive, demographic or noncognitive variables. In particular, these authors argued that traditional cognitive variables are less useful in predicting performance for African-American males than for African-American females. In addition, the type of college environment (predominately African-American or White) may directly affect the psychological and emotional well being of African-American college students as well as their overall academic success (Fleming, 1984; Gurin & Epps, 1975; Washington, 1996).

Therefore, researchers propose a variety of cognitive, noncognitive, demographic, and student college interaction variables to explain academic success for African-American students (Astin, 1993; Sedlacek, 2004; Tinto, 1975, 1993; Tracey & Sedlacek, 1984; Washington, 1996). Likewise, Pfeifer and Sedlacek (1971) and Temp (1971) argue that a single prediction system is not practical and may be inappropriate for many students in college today. Therefore, researchers continue to study the unique variables of academic success for African-American students (Astin, 1993; Tracey & Sedlacek, 1985) and

particularly African-American males (Johnson, 1993; Hood 1992; Wilson-Sadberry, 1991) to improve predictions of academic success and persistence.

Higher education depends on the ability of its institutions to recruit and retain students, many of whom may lack sufficient preparation for university level work (Astin, 1975; Tierney, 1983). As House (1994) states "[t]here is a continuing interest in the identification of effective predictors of academic achievement" (p.3). This interest is in response to disparities in success rates between minority students and the majority White students, particularly in predominantly White institutions (PWIs; Sedlacek & Webster, 1978; Tracey & Sedlacek, 1984, 1987*)*.

In the last thirty years in particular, researchers began to notice two disturbing trends: (a) that persistence rates were much lower for African-American students (Tracey & Sedlacek, 1987) and (b) that differences in persistence were not found to be related to traditional ability measures (Tracey & Sedlacek, 1987). To date, "high attrition rates have proven especially damaging to the population of 'at risk' and minority students in institutions of higher education nationwide" (Hood, 1992, p.12). Smedley, Myers and Harrell (1993) noted that at risk students who are African-American are less likely to graduate, have lower grade point averages, experience higher attrition rates and graduate at lower rates than White students. Understanding the variables contributing to the lack of academic success for African-American students is important to society as a whole (Moore-Green, 1991), to prepare African-American youth for leadership in society (Fordyce, 1991), and for the overall survival of historically Black colleges and universities (HBCUs). However, identifying the specific predictors of academic success and persistence for African-American students is formidable. Overall, there are limited data available on the prediction of

academic success and persistence of African-American students (Phillip, 1993) and particularly at HBCUs (Washington, 1996).

Historical Background of HBCUs

Identifying the variables related to the successful performance and persistence of African-American students is critical to the continued existence of HBCUs (Martin, 1990; Moline, 1987), and understanding the origins and education of African-American students in the United States is necessary to fully comprehend the importance of HBCUs and their impact within the African-American community (Dartson, 1998). HBCUs are a comparatively young group of higher education institutions in the United States. HBCUs are largely an outcome of the Civil War and Emancipation. However, the first private HBCUs were established before the Civil War in Ohio at Wilberforce in 1856 and in Pennsylvania at Cheney State in 1837 and at Lincoln in 1845 (Allen & Haniff, 1991). HBCUs were founded in the 1800's because "of racism and the belief that Blacks were not good enough (or human enough) to attend school with Whites" (Grimes, 1996 as cited in Jenkins, 2000, p.2). Therefore, the American segregated educational system led to the rise of HBCUs (Allen & Haniff, 1991; Bowles & DeCosta, 1971). HBCUs allowed African-American women and men opportunities for higher education in a time when discrimination and segregation laws did not permit African-Americans into White institutions of higher learning or even primary education (Fleming, 1984).

More than one hundred years later, HBCUs continue to play a vital role in the higher education of African-American college students in the United States (Allen & Haniff, 1991; Fleming, 1984; Sowell, 1972). Whereas PWIs typically admit students based on test scores, membership in organizations or clubs, or family financial contributions, HBCUs employ

affirmative procedures to provide equal opportunities to all people (Arco, 1995; Bowles & DeCosta, 1971; Jaffe, Adams & Meyers, 1968; Sowell, 1972; Zulema Enterprises, 1992). In fact, HBCUs accept African-American students when other higher education institutions will not, especially those students with low test scores and poor preparation (Dartson, 1998). According to the National Center for Education Statistics, over 280,000 students attended 103 HBCUs in 1994 and enrollment at HBCUs increased approximately 28% between 1976 and 1994 (Hoffman, 1996). In fact, 26% of all bachelor's degrees received by African-American students are conferred by HBCUs (Hoffman, 1996).

According to McGrath (1965), African-Americans have demonstrated an unyielding commitment to education, particularly access to higher education, as a means of improving chances of achieving equal opportunity. Likewise, research continues to demonstrate HBCU's effectiveness in providing an environment conducive to the social and psychological needs of African-American college students (Dartson, 1998). Although some studies have focused on what happens to African-American students at HBCUs (Brice, 1992; Moore-Green, 1991; Wright, 1982), Moore-Green (1991) noted most research has focused on African-American students at PWIs.

Differences between HBCUs and PWIs

Understanding the differences between HBCUs and PWIs includes understanding the differences in outcomes for African-American students attending these two types of institutions. In fact, the available research examining the impact of HBCUs versus PWIs on African-American students has shown significantly different outcomes between the two types of institutions. For instance, students at HBCUs reported putting forth greater effort in academic activities than students at PWIs (Jenkins, 2000). In addition, Jenkins found

attrition rates to be high among African-American college students attending PWIs. Likewise, Dartson (1998) noted that African-American students attending HBCUs are three times more likely to graduate from college and have higher self-esteem and lower anxiety than African-American students attending PWIs. Similarly, Clawson (1983) found that African-American students at HBCUs were more satisfied with their social life than African-American students at PWIs. In addition, African-American students at HBCUs scored higher in physical self-concept and moral/ethical self-concept than students at PWIs (Clawson, 1983). Additional research has suggested that African-American students often encounter problems with cultural adjustment, social isolation, and racism at PWIs (Fleming, 1982, 1984; Nettles, Theony & Gosman, 1986).

Fleming's (1984) report on African-American students at 15 PWIs across the United States utilized many measures to assess students, including measures of socioeconomic status, cognitive ability, achievement, adjustment, and personality. Fleming found differences between the African-American students attending HBCUs and PWIs on several psychosocial variables. In fact, she found psychosocial adjustment and academic achievement for African-American students at HBCUs to be more positive than those students attending PWIs. In addition, Fleming noted that African-American students attending HBCUs demonstrated significant increases in achievement and showed marked overall success as compared to African-American students at PWIs. She found that African-American students at PWIs did not show significant development in their intellectual functioning. Overall, Fleming found that African-American students attending HBCUs experienced better social adjustment, better affiliation, and a better developed identity than African-American students attending PWIs. Fleming's conclusions included that African-American males attending PWIs felt

alienated and insecure in their relationships; whereas, African-American males at HBCUs felt more confident and experienced more cognitive and social growth.

In a different study comparing African-American students at HBCUs and PWIs, Braddock and McPartland (1988) found that there were no significant differences in degree completion between the two types of institutions. However, they did find that more students at HBCUs completed their degree work in four years than African-American students at PWIs who tended to take longer than four years to graduate. African-American graduates from PWIs, however, tended to make more money upon graduation than did African-American graduates from HBCUs. The authors suggested the financial difference was a result of preexisting differences in socioeconomic status, high school achievement test scores, region, major, and years of work experience.

DeSousa and Kuh (1996) examined the educational gains of African-American students based on their involvement in campus activities. Their research compared African-American students at a PWI and an HBCU located in the mid-Atlantic region of the United States. DeSousa and Kuh reported that African-American students at HBCUs reported greater gains than African-American students at PWIs in (a) personal and social development; (b) critical thinking and science/technology; (c) vocational and career skills; (d) history and cultural awareness; and (e) arts and literature. According to the authors, involvement in social and interpersonal networking influenced the African-American students' educational development at PWIs; whereas, involvement in academic activities more than in social and interpersonal networking influenced African-American students' development at the HBCUs more. DeSousa and Kuh also concluded that African-American students from HBCUs devoted more time to academic activities because these students did

not need to deal "with racism, isolation, alienation, and [the] lack of emotional support" typically found at PWIs (p. 263). From the results, DeSousa and Kuh inferred that HBCUs provide a richer learning environment for African-American students than that found at PWIs.

Allen and Haniff (1991) examined academic performance, racial attitudes, and college satisfaction. The purpose of their study was to investigate qualitative differences between African-American students attending public HBCUs and PWIs. Their study included 1,583 African-American students from eight HBCUs and eight PWIs. The authors reported several findings: (a) African-American students at HBCUs reported significantly higher grade-point averages than their peers at PWIs; (b) 62% of students from PWIs and 44% of students from HBCUs had a negative view of unity among African-American students on respective campuses; (c) significantly more students at HBCUs than students at PWIs reported feeling that activities on their campus represented their interests; (d) significantly more students from HBCUs than PWIs reported positive relationships with White faculty; and (e) students from HBCUs were more likely to aspire to graduate school than students from PWIs.

Allen (1988) reported results from the 1981 to 1983 phases of data collection for the National Study of Black College Students. During 1981 and 1983, 1,853 students from six public PWIs and eight public HBCUs participated in the study. Allen found that African-American students at HBCUs had higher grade-point averages than African-American students at PWIs. In addition, there were significantly more students at HBCUs than at PWIs who reported that campus activities were representative of their interests. Similar to Allen and Haniff's (1991) finding, Allen (1988) noted that African-American students at HBCUs

reported more favorable relationships with White faculty at their universities than African-American students at PWIs.

In 1987, Hughes conducted a qualitative study that examined the difference between African-American students' experiences at PWIs and HBCUs. According to Hughes' research, African-American students at both types of universities indicated a reliance on spiritual strength, as they pursued higher education. In addition, African-American males and females at both types of universities sought to attain a college degree because of the belief that a college degree was needed to improve their future. Finally, students at PWIs reported more stress and alienation than students at HBCUs.

Research has shown that there are distinct social, cultural and academic advantages for African-American college students who attend a HBCU as opposed to a PWI (Dartson, 1998). According to Darston (1998), HBCUs stress affiliation, collectivity, interdependence, respect for elders, and obedience for authority; whereas, PWIs stress individuation, autonomy, isolation from others and existing in themselves (Carter & Helms, 1987). In fact, students attending HBCUs overwhelming report feeling more comfortable in their majority African-American academic settings provided by HBCUs (Dartson, 1998). According to Dartson, HBCUs offer ideal environments for learning and achieving, as these colleges and universities are typically characterized by small classes, student enrollments of one to five thousand, regular advising by faculty and staff, high standards of academic quality, and a diverse faculty and staff. Other researchers have also suggested that HBCUs offers an atmosphere conducive to the academic, psychosocial, and cultural success of the African-American college student (Carter & Helms, 1987; Fleming, 1984).

In fact, HBCUs seem to promote an atmosphere of ethnic pride and consciousness, which is crucial in the development of self-esteem and a sense of self-worth (Dartson, 1998; Gurin & Epps, 1975). For instance, Fleming (1984) found significant improvement in academic functioning, intellectual confidence and feelings of success and satisfaction with academic life for African-American students attending HBCUs. Several researchers have documented that African-American students attending HBCUs are twice as likely to matriculate as African-American students attending PWIs (Fleming, 1984; Gurin & Epps, 1975). In fact, the very foundation of HBCUs is to provide a supportive, comfortable environment for African-American college students.

African-American students at PWIs have not been as successful as their HBCU counterparts. In comparison to White students, African-American students attending PWIs tend to have lower grade point averages, are less likely to do postgraduate work, and have higher attrition rates (Dartson, 1998; Fleming 1984; Gurin & Epps, 1975). Overall, the research reviewed indicated that African-American students at PWIs were less satisfied, participated less, and had worse overall experiences at PWIs than White students at the same type of university (Dartson, 1998; Fleming, 1984; Jenkins, 2000; Washington, 1996). Specifically, African-American students at PWIs reported greater feelings of isolation and alienation (Jenkins, 2000). For example, Mannan (1986) concluded that the lack of integration into the social environment at PWIs accounted for a significant portion of the lower grades for African-American students attending a commuter college. In addition, Hood (1992) found that African-American males were more likely to be among those academically dismissed from a PWI during the first semester.

Some studies have found no significant differences between the experiences and outcomes for African-American students attending either PWIs or HBCUs. For instance, Wesley and Abston (1983) found that there was no difference in African-American and White undergraduates' rating of satisfaction with working conditions and quality of education. Likewise, White, Suddick, and Brown (1981) found that 93% of African-American students surveyed rated their educational experience as "excellent," "very good," or "good." In addition, 90% of these students would recommend the university to a friend and 84% would recommend the university to a family member (White et al., 1981). However, the overall research available suggests that African-American college students experience significantly different psychosocial, academic, and cultural development depending on the type of institution (HBCU or PWI) they attend.

Clearly, the experiences and outcomes for African-American students at HBCUs versus PWIs are significantly different but what about predictors of academic success and persistence for African-American students attending the two types of institutions? Though several studies examined the outcomes, few studies compared the predictors of academic success and persistence for African-American students attending the two types of institutions. In particular, predictor variables beyond the traditional cognitive variables, such as SAT scores and HSGPA, have not been researched. Therefore, the purpose of this exploratory study is to examine whether noncognitive variables predict academic success and persistence of African-American students differently at a public PWI versus a public HBCU.

Research Questions

During the summer of 2004, a team of graduate students began coding noncognitive data from a research study utilizing the Noncognitive Questionnaire (NCQ). The study

examined eight noncognitive variables: positive self-concept, realistic self-appraisal, understands and deals with racism, preference for long-range goals, availability of strong support person, successful leadership positions, demonstrated community service, and knowledge acquired in a field. During the process of coding responses to the qualitative portion of the NCQ, several members of the research team began to notice differences between the responses from NCSU, a predominantly white institution, and NC A&T, a historically black university. For instance, in response to the past accomplishments portion of the NCQ, African-American students at NCSU were proud to have graduated from high school and to have been accepted to college; whereas, several African-American students from NC A&T were simply proud to have not been killed during high school. The response regarding not being killed occurred numerous times in the NC A&T sample and did not occur in the NCSU sample at all. Therefore, this researcher began to wonder if the dramatic differences in past accomplishments and other noncognitive areas might indicate possible differences in potential predictors of success and persistence for African-American students at the two universities.

Even though there are clearly positive and negative attributes to attending both PWIs and HBCUs, there is little published research that looks specifically at the differences in predictors of academic success and persistence among African-American students who attend PWIs as compared to African-American students who attend HBCUs. Instead, the majority of published research focuses on differences in outcomes (Allen, 1988; Allen & Haniff, 1991; Braddcock & McPartland, 1988; DeSousa & Kuh, 1996; Fleming, 1982, 1984; Nettles et al., 1986; Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1996). In light of limited number of studies that compare predictors of academic success and persistence for African-

American students who attend PWIs to those who attend HBCUs, the purpose of this exploratory study is to examine whether noncognitive variables predict academic success and persistence of African-American students differently at a public PWI versus a public HBCU. The following research questions will be examined in this study:

1. Do noncognitive variables predict academic success for African-American students differently at a PWI versus a HBCU?
2. Do noncognitive variables predict college persistence for African-American students differently at a PWI versus a HBCU?

Definitions

The following terms will be utilized throughout this study. Tracey and Sedlacek (1984) provided the definitions for the eight noncognitive variables. All other definitions are provided by the author unless otherwise noted.

1. Academic Success – College GPA, criteria for success
2. African-American or Black - A person of African descent (Asunte, 1988, as cited in Dartson, 1998)
3. Availability of Strong Support Person – Has someone to turn to for support; noncognitive variable
4. College Grade Point Average (CGPA) - Measure of academic success in college
5. Demonstrated Community Service – Involvement in cultural community; noncognitive variable
6. Enrollment Status – Continued enrollment = 1; Discontinued enrollment = 0
7. Gender – Male or female

8. HBCU – Historically Black college or university; majority of student population identifies as African-American
9. High School Grade Point Average (HSGPA) – Measure of average academic performance in high school
10. Knowledge Acquired in a Field – Measure of experience in a field of knowledge; noncognitive variable
11. Persistence – Continued enrollment at same institution
12. PWI – Predominantly White Institution; majority of student population identifies as Caucasian
13. Preference for Long-Range Goals – Able to defer gratification; noncognitive variable
14. Positive Self-Concept – Strong feelings of strength, character, determination, and independence; noncognitive variable
15. Realistic Self-Appraisal – Recognizes and accepts deficiencies and works hard at self-development; noncognitive variable
16. SAT – No longer considered an acronym; formerly the Scholastic Aptitude Test or Scholastic Assessment Test
17. Successful Leadership Experience – Any leadership in any area pertinent to student's experience; noncognitive variable
18. Understands and Deals with Racism – Does not collude but instead is committed to reducing existing systems of racism; noncognitive variable

Delimitations, Limitations, and Assumptions

The following are the assumptions and delimitations that guide this study:

1. Predictors chosen for the study are not exhaustive,
2. Study limited to African-American respondents,
3. Sample limited to African-American freshman students who completed NCQ either in their freshmen English class (PWI) or during their freshman orientation (HBCU) in the Fall of 2003,
4. Subjects gave honest responses on the instrument administered,
5. Sample limited to usable copies of the NCQ, and
6. Lack of randomization viewed as a minor threat to study's ability to determine correlation between variables.

CHAPTER 2

LITERATURE REVIEW

Introduction

In this chapter, the author will review the available literature relevant to African-American students at HBCUs and PWIs. The author will examine demographic, cognitive, and noncognitive variables. In addition, the author will briefly review Sternberg's Triarchic Theory of Intelligence as the foundation of noncognitive theory. Finally, the author will provide a synthesis of the literature review.

Sternberg's Triarchic Theory of Intelligence

Noncognitive variables are "affective variables… psychosocial constructs, subjective in nature, that describe the feelings, perceptions, and/or attitudes one has regarding psychosocial phenomena, which are exhibited by numerical score, rank or range" (Johnson, 1993, p.19). Interests in noncognitive variables emerged as a result of the growing concern to effectively and unbiasedly predict success outcomes for minority students in response to the perceived ineffectiveness of traditional measures (Washington, 1996). For instance, Sedlacek (1979) found support for a negative relationship between traditional standardized test scores and college grades for minority students. Therefore, researchers, such as Kanoy, Wester, and Lata (1989), suggested that noncognitive variables could provide institutions with a "different way to predict student performance in college" (p.65).

A major proponent of taking a more comprehensive look at intelligence and potential for performance is Sternberg (1985). Much of the literature regarding noncognitive variables credits Sternberg's Triarchic Theory of Intelligence as the foundation of noncognitive theory.

According to Sternberg (1985), "intelligence is the mental capability of emitting contextually appropriate behavior at those regions in the experimental continuum that involve response to novelty automatization of information processing as a function of metacomponents, performance components, and knowledge-acquisition components" (p. 128). Behavior is intelligent to the extent that it is (a) used in adaptation to, selection of, or shaping of one's environment; (b) responsive to a novel kind of task or situation or in the process of becoming automatized; and (c) the result of metacomponential, performance-componential, or knowledge-acquisitional functioning. According to Sternberg, intelligence is, in part, the ability to succeed in context, but not necessarily success per se, which may be moderated by a host of variables, such as socioeconomic status, that are unrelated to intellectual ability. Self-knowledge in terms of one's abilities, interests, and motivations can make the difference between high intelligence as exhibited in one environment and low intelligence as exhibited in another.

In the United States and other developed countries, three primary skills are considered to be representative of intelligence: problem-solving ability, verbal ability, and social competence. Sternberg (1985) argues that the traditional view of intelligence tests is often represented by a one dimensional scale, such as IQ, which typically leads to the view that exceptional intelligence, as represented by intellectual giftedness and retardation, are true opposite ends of a single scale. Contrary to the traditional view, Sternberg argues that intelligence tests should instead measure or at least predict behaviors that are relevant to the cultural context in which an individual lives. Likewise, he notes that no single measurement results in a definitive IQ, because one instrument can only work for some of the people some of the time. Similarly, no intelligence test can be truly culture-free. Therefore, all

intelligence tests are imperfect predictors of academic achievement because there is more to intelligence than is measured by standard intelligence tests and because there is more to school achievement than componential intelligence. According to Sternberg (1985), IQ tests usually only account for between 5% and 25% of the variance in academic performance (p. 313). In addition, Sternberg identified a major weakness of standard intelligence testing in that many items included in psychometric tests of intelligence have been chosen primarily on the basis of their correlations with each other or with external criteria, such as grades in school, without reference to an internally validated theory of intelligent performance. Sternberg (1985) believes that the "only circumstances relevant to the evaluation of someone's intelligence are those under which the individual has some behavioral control and under which the individual has an adequate opportunity to express his or her intelligence" (p. 55). If intelligence is indeed more than what is measured by IQ tests, then strong demonstrations of the validity of existing theories for real-world performance are needed. Sternberg views many of the existing theories of intelligence as incomplete rather than incorrect. This is why Sternberg advocates for the use of multiple criteria that overlap and build on one another.

Sternberg (1985) seeks to understand intelligence in terms of three subtheories: a componential subtheory that relates intelligence to the internal environment of the individual, an experiential subtheory that applies to both the internal and external environments, and a contextual subtheory that relates intelligence to the external environment of the individual. Componential intelligence is the ability to learn how to do things and how to acquire new knowledge (Sternberg, 1985). Standardized tests, such as the SAT, measure this type of intelligence. Experiential intelligence is the ability to adjust to new tasks, use new concepts,

respond to new situations, and gain insight (Sternberg, 1985). Contextual intelligence is the ability to adapt to a changing environment (Sternberg, 1985). The Noncognitive Questionnaire (NCQ) measures experiential and contextual intelligences.

Each of the three subtheories of Sternberg's (1985) Triarchic Theory of Intelligence has received at least some empirical validation and elaboration, although more empirical research and theory development are needed. The Triarchic Theory of Intelligence is an attempt to have a single theory that accounts for what has been explained for in the past by multiple theories that have been perceived to be in conflict with each other. Sternberg (1985) claims that his Triarchic Theory of Intelligence was simultaneously constructed "from the top, down, and from the bottom, up" which in his opinion "enables the triarchic theory to be broad in scope, but nevertheless firm in its links to data" (p. 321). However, Sternberg does not fully explain how his theory is both inductive and deductive.

Noncognitive Variables

As Sternberg (1985) advocated, the addition of noncognitive variables to purely cognitive variables has been shown to improve the overall prediction of academic success and persistence (Pickering, Calliotte, & McAuliffe, 1992). Tracey and Sedlacek (1984) defined noncognitive variables at the non-intellectual aspects, such as self-concept and motivation, of a student's personality which influence learning. Studies of selected noncognitive variables have provided evidence "that nontraditional dimensions account for as much or more of variance in retention rates, particularly for minority students" (Hood, 1992, p.13). Several noncognitive variables have been identified as useful predictors of academic performance including; personality (Brown, 1994), self-responsibility (McConatha, 1990), self-concept (Johnson, 1993), academic self-concept (Gerardi, 1990; Johnson, 1993),

motivation (Livengood, 1992), locus of control (Kanoy et al., 1989), expectations and self-expectancy (Haynes & Johnson, 1983; Trippi & Stewart, 1989), and self-efficacy (Schunk, 1991). Several studies have shown noncognitive variables to be better predictors of academic success for minority students (Sedlacek & Adams-Gaston, 1992; Tracey & Sedlacek, 1984, 1987).

Sedlacek and Brooks (1976) and Tracey and Sedlacek (1984) proposed eight noncognitive variables as being useful in predicting success for African-American students. Hood (1992) expanded the NCQ items and revealed differences related to gender on persistence for minority students. Hood found that leadership, academic organization, social integration, long-range goals, and racial homogeneity were significant for African-American males while social integration and social control were important for African-American female persistence. Woods and Sedlacek (1988) found the noncognitive variables to be related to particular aspects of academic success among minority students. The eight noncognitive variables identified by Tracey and Sedlacek (1984) and Sedlacek (1999) are

1. Positive Self-Concept: A successful individual felt confident in his or her ability to graduate regardless of the obstacles that may arise. The individual expected to do well in both academic and nonacademic areas and made positive statements about his or herself and assumes an ability to handle any challenges that may come his or her way. There is a high level of self-efficacy and self-esteem.
2. Realistic Self-Appraisal: The individual was able to recognize and accept background academic deficiencies while working toward personal development. The individual recognized criticism or rewards as logical consequences of performance, even though evaluations can be biased.

3. Understands and Deals with Racism: The individual has a realistic view of racism based on personal experience and understood the role of the system in his or her life and how the system impacts minority individuals. The individual had developed a method of assessing and responding to cultural or racial demands. Similarly, the individual did not blame others for his or her own struggles and reacted to injustice when appropriate.
4. Preference for Long-Range Goals to Short-Term or Immediate Needs: The individual could set goals and progress in a timely manner without reinforcement. The individual was able to exhibit patience and accept partial fulfillment of a longer term goal over a period of time. The individual had a future and a past orientation allowing the individual to look beyond the immediate situation to the benefits of planning for long term academic and non-academic goals.
5. Availability of a Strong Support Person: The individual was able recognize the need for help and was willing to ask for help. The individual has identified at least one individual who provided support and encouragement on a regular basis. The individual also recognized the difficulties inherent in being a loner and rarely relied solely on his or her own resources to address problems.
6. Successful Leadership Positions: The individual has experience in leadership positions and has influenced and assisted others in both academic and nonacademic situations. The individual was comfortable providing advice and mediation to peers. Similarly, the individual had no problem taking appropriate action when a situation called for action.

7. Demonstrated Community Service: The individual identified with a cultural, geographic and/or racial group that has a specific and long-term relationship within the community. Similarly, the individual had a history of involvement in community based activities and/or organizations that have accomplished specific goals in the community setting.
8. Knowledge Acquired in a Field: The individual had nontraditional, culturally and/or racially based experience and knowledge regarding a field or area that may or may not have been formally studied in school. Also, the individual has developed innovative and creative ways in which to acquire information about a particular area.

Rogers (1984) demonstrated support for the noncognitive variables as predictors of academic success for minority students. Rogers found past community service, sense of pride in past accomplishments, support from families and friends and relatives, and realistic understanding of racism significant for predicting college grades for African-American freshmen. Three noncognitive variables were particularly useful predictors for African-American males: showing pride in accomplishments that related to leadership activities, not getting easily discouraged, and expecting to have a difficult time at college. Pride in accomplishments and having support from relatives and friends to attend college were the most significant noncognitive variables for African-American females. Overall, Roger's study of African-American freshman found selected NCQ items better predictors of CGPA than SAT scores alone.

In studies that compare noncognitive and traditional cognitive variables, results remain inconclusive and research findings are often contradictory. Supporters of noncognitive variables suggest that success for minority students is related more to important

noncognitive attributes than to academic ability alone (Sedlacek, 1987). Washington (1996) found noncognitive variables to be more effective and at times equal to standardized test scores, especially the SAT, as predictors of academic success, and Tracey and Sedlacek (1984, 1987) have consistently found the NCQ items to be better predictors of academic performance for minority students than SAT scores. In particular, Tracey and Sedlacek (1985) found that preference for long range goals was significant in predicting early first and third trimester grades, that demonstrated community service prior to college was found to be predictive for the sixth to eighth semester grades, and that positive self-concept and realistic self-appraisal were predictive of grades at all points for minority students at a PWI. Tracey and Sedlacek's eight noncognitive variables have received considerable attention in the literature and have proven to be significantly related to students' CGPAs. However, research related to whether noncognitive variables offer greater predictability than the traditional cognitive variables, such as HSGPA and SAT scores, is inconclusive as findings go in both directions.

For instance, Corlett and Schendel (1987) concluded after examining traditional and nontraditional variables of students at the University of Portland in Oregon that traditional variables were better than nontraditional variables as predictors of academic success. Likewise, Williams and Leonard (1988) found the traditional cognitive measures of HSGPA and SAT scores to be more important predictors than the noncognitive variables of racial identity, self-efficacy, vocational interests, and college environment. In a comparative study of the predictability of both cognitive and noncognitive variables, Arbona and Novy (1990) found that for African-American, Mexican-American, and White freshmen, that noncognitive dimensions, as measured by the NCQ, were not predictive of college grades. However,

several authors have argued that combining traditional cognitive predictors with nontraditional noncognitive predictors offers the most useful model to predict academic performance (Pickering et al., 1992; Ting, 2000; Ting & Robinson, 1998; Ting & Sedlacek, 2000).

Over the past thirty years, researchers have identified a wide variety of cognitive and noncognitive factors that may predict college persistence. For instance, Shaffer (1981) found high academic achievement in high school and socioeconomic status related to African-American male persistence while previous leadership experience, closer relationship with mother, and higher academic achievement in high school were predictive of persistence for African-American females. In a study of African-American freshmen at eight Mississippi public institutions of higher education, Whiley (1983) found among other variables that the size of the high school attended by African-American freshmen and HSGPA were statistically significant in identifying those students who persisted beyond the freshman year. Whereas, Brower (1992) found that students who persisted in college were more focused on academics during their first semester and social and personal needs during their second semester. In addition, Tracey and Sedlacek (1985) concluded that although many of their noncognitive variables were found to be significant for identifying African-American students who persisted, that support for college and preference for long range goals were important for predicting the first two years of college persistence; that demonstrated community service and having an understanding of racism were important for later periods; and that positive self-confidence, realistic self-appraisal of academic skills, and academic familiarity were significant for predicting academic success and persistence across all periods of enrollment in a PWI.

Likewise, Kraft (1991) conducted a qualitative study examining students' explanation of their academic success and/or the academic success of other African-American students at a PWI. Forty-three African-American students were asked to describe possible factors for academic success and explain why some African-American students at PWIs do better academically than others. According to Kraft, the African-American students indicated racism and alienation as primary factors. Unfortunately, the qualitative nature of this study reduces the generalizability; however, the study provides valuable information about possible factors influencing African-American students' experiences and potential success.

In one of the few studies that compared the experiences of African-American students at HBCUs and African-American students at PWIs, Dawkins and Braddock (1982) examined the following variables: (a) social background factors, (b) high school experiences, (c) college attitudes and experiences, and (d) college outcomes. Their study included 549 males and 898 females from PWIs, and 443 males and 1,002 females from HBCUs. The authors found that overall, regardless of the racial makeup of the institution attended, there was a greater correlation between college experiences and college outcomes than social background and high school experiences. In particular, Dawkins and Braddock found that college experiences and college satisfaction were good predictors for African-American females at PWIs. In addition, college grades were a better predictor for African-American females and males at PWIs than students at HBCUs. They also found that when grades were measured as an outcome, college degree plans were a better predictor for African-American males at PWIs; whereas, college satisfaction, participation in activities, and expected academic achievement were better predictors of grades for African-American females at HBCUs. In

addition, high school rank and mother's education were good predictors of grades for African-American males at HBCUs.

However, Hood (1992) found traditional pre-college variables, including Tracey and Sedlacek's (1984) eight noncognitive variables, to be insufficient predictors to discriminate between those likely to drop out of college during the first semester and those who are likely to persist. Similarly, Pascarella (1985) and Cooper and Michael (1990) failed to find a significant relationship between academic self-concept and degree completion.

Conclusion

Needless to say, there is a significant debate regarding the appropriate blend of cognitive and noncognitive variables necessary to accurately predict academic success and persistence. Overall, though, the literature identifying predictors of academic success and persistence for African-American students at both HBCUs and PWIs suggests that both cognitive and noncognitive variables are useful predictors of academic success and persistence with each offering varying degrees of predictability across institutions. Most researchers agree that SAT scores and HSGPA are important variables for any prediction equation; however, there is not as much consensus on what other variables should be included. The literature indicates that Tracey and Sedlacek's (1984) eight noncognitive variables have accurately predicted academic success and persistence for African-American students at both HBCUs and PWIs. Limited research is available, however, when attempting to determine what, if any, differences exist in the specific noncognitive variables that predict academic success and persistence for African-American students attending an HBCU versus a PWI. Therefore, the purpose of this exploratory study is to examine whether noncognitive

variables predict academic success and persistence of African-American students differently at a public PWI versus a public HBCU.

CHAPTER 3

METHOD

Introduction

This chapter will present the method to be used in this study. The author will describe the purpose of the study, research questions, description of institutions, population, data collection, sample, instrumentation, and data analysis.

Purpose of the Study

Noncognitive variables have successfully been used as predictors of academic success and persistence for minority students (Sedlacek, 2004; Ting & Robinson, 1998; Tracey & Sedlacek, 1984). Although most researchers agree that SAT scores and HSGPA are important components of any prediction equation for college admissions, there is less agreement on which noncognitive variables should be included and when. For instance, the research clearly demonstrated significant differences between African-American students at PWIs and HBCUs; however, little research has been done that compares the use of noncognitive variables between the types of institutions. The purpose of this exploratory study is to examine whether noncognitive variables predict academic success and persistence of African-American students differently at a public PWI versus a public HBCU.

Research Questions

In light of the limited research comparing the efficacy of noncognitive variables in predicting academic success and persistence at a PWI versus a HBCU, the following research questions were examined in this study:

1. Do noncognitive variables predict academic success for African-American students differently at a PWI versus a HBCU?

2. Do noncognitive variables predict college persistence for African-American students differently at a PWI versus a HBCU?

Description of Institutions

North Carolina Agricultural and Technical State University (NC A&T) is an accredited comprehensive, land-grant university that provides degrees at the baccalaureate, master's, and doctoral level. The University consists of the following: College of Arts and Science, College of Engineering, and six professional schools (Agricultural, Business and Economics, Education, Nursing, Technology, and Graduate Studies). NC A&T was originally established in 1891 as the Agricultural and Mechanical College for Negroes in Raleigh and is now located in Greensboro, North Carolina, a large metropolitan area in the Southeast. The University merged into the University of North Carolina university system in 1972. In 2003, 94% of the freshmen class identified as African American, and the average SAT Total Score for the 2003 entering freshmen class was 889 (The University of North Carolina, 2003).

North Carolina State University (NCSU) is a major accredited research land-grant university that provides degrees at the baccalaureate, master's, intermediate, first professional, and doctoral level. The University consists of the Graduate School and eleven colleges (Agricultural & Life Sciences, Design, Education, Engineering, First Year College, Humanities and Social Sciences, Management, Natural Resources, Physical and Mathematical Sciences, Textiles, and Veterinary Medicine). NCSU was established in 1887 and merged into the University of North Carolina university system in 1931. The University is located in Raleigh, North Carolina, a large metropolitan area in the Southeast. In 2003,

9.8% of the freshmen class identified as African American, and the average SAT Total Score for the 2003 entering freshmen class was 1195 (The University of North Carolina, 2003).

Population

The population for this study includes African-American students classified as entering freshmen for the 2003-2004 academic year at both NC A&T and NCSU. The 2003 entering freshmen class for NC A&T consisted of 2,238 students of which 2,108 (94%) identified as African-American students (NC A&T Office of Planning, Assessment, & Research, 2003). The 2003 entering freshmen class for NCSU consisted of 3,931 students of which 384 (9.8%) identified as African-American students (NC State University Planning & Analysis, 2003).

Data Collection

This study utilized extant data that were collected during the fall of 2003. Dr. Raymond Ting, the Primary Investigator (PI) of the Noncognitive Questionnaire (NCQ) Research Project, arranged the data collection at each participating campus. Students attending required first-year English classes (NC State) or new student orientation (NC A&T) were invited to participate in the study. Students who volunteered to participate signed an informed consent. The PI provided instructions to the first-year English class instructors and the orientation staff regarding the administration of the survey. The instructors and orientation staff distributed the NCQ when students met in small groups/classes. Students also received a consent form and information about the study. The NCSU consent form is in Appendix A, and the NC A&T consent form is in Appendix B. The students who volunteered to participate were asked to provide consent for study participation and access to their academic records. Information collected has been treated confidentially. The survey

questions had minimal psychological risks for the participants, and the participants were not reimbursed in any form for their participation in the study. Participating institutions received their students' NCQ profiles.

The investigator obtained the age, Spring 2004 GPA, and Spring 2004 enrollment status for each student for the Spring 2004 from each institution. All data were analyzed and stored in a locked safe place in the PI's department office, the project center. Only group information was used and reported. Collected information will be destroyed six months after the completion of the NCQ Project reports.

Sample

The sample included African-American students who completed usable copies of the NCQ and for whom the investigator was able to collect age, Spring 2004 GPA, and Spring 2004 enrollment status. The sample consisted of 58 African-American students from NCSU (9.7%) and 538 African-American students from NC A&T (90.3%). This discrepancy in sample size was expected in light of the substantial difference in population of African-American students at the two universities. J. Dietz, a statistician for Meredith College, and T. Chen, a statistician at NCSU, recommended utilizing the full samples from both universities (personal communication, August 30, 2004).

Instrument - Noncognitive Questionnaire (NCQ)

Tracey and Sedlacek's (1984) NCQ consists of 23 questions: (a) 18 Likert-type items addressing self-assessment and college expectations, (b) two nominal items on educational expectations, and (c) three open-ended questions regarding present goals, past accomplishments, group membership and past leadership experiences. The NCQ envelopes the earlier work of Sedlacek and Brook (1976), includes eight noncognitive variables

(Sedlacek, 1987), and has been found to predict graduation from college for African-American students (Boyer & Sedlacek, 1989; Tracey & Sedlacek, 1987) as well as persistence for African-American students (Tracey & Sedlacek, 1984, 1985).

In 1984, Tracey and Sedlacek examined whether the NCQ could successfully predict academic success in both Caucasian and African-American samples. The authors utilized two separate samples of incoming freshmen at the University of Maryland, College Park (1979, n = 1644; 1980, n = 478). In their final model, the Model X^2 (218.21) was statistically significant at the 0.001 alpha level. The authors established the external validity of the NCQ as a predictor of academic success which they defined as both grade point average (R^2 ranged from .29 to .48) and continued enrollment (R^2 ranged from .18 to .49). In addition, the results of Tracey and Sedlacek's (1984) factor analysis demonstrated support for at least six noncognitive variables (variance reported in parenthesis): Leadership (32.8%); Recognizing Racism (13.9%); Preference for Long-term Goals (13.5%); Realistic Self-Appraisal (10.9%); Support for College Plans (9.1%); and Self-confidence (14.2%). Additional support for the NCQ's construct validity was found using factor analysis by several other authors (Arbona & Novy, 1990; Boyer & Sedlacek, 1988; Ting & Sedlacek, 2000; Woods & Sedlacek, 1988).

The NCQ (Appendix C) is a self-report survey that consists of 34 questions: two questions requesting demographic information, two questions requesting father's and mother's educational level, two questions pertaining to educational and retention expectations, six involvement questions, two open-ended items asking participants to list three personal goals and three accomplishments, two open-ended items identifying involvement expectations, and eighteen Likert-type item dealing with college expectations, support systems, and self-assessment. The investigator utilized the NCQ scoring sheet,

entitled the *Revised Scoring Key for Supplementary Admissions Questionnaire II (NC State version)*, as provided by Sedlacek (1990). A copy of the scoring key is in Appendix D. The key provides scoring guidelines for every item of the NCQ. The investigator received training in the use of the NCQ and the scoring key from Dr. Raymond Ting, an expert in the use of the NCQ. Table 1 explains which NCQ items determine specific noncognitive variable profile scores.

Table 1

NCQ Items used to score each Noncognitive Variable Profile

Noncognitive Variable	Items
Positive Self-Concept	1, 4, 16, 26, 29, and 34
Realistic Self-Appraisal	4, 18, and 27
Understands and Deals with Racism	17, 24, 28, 32, and 33
Preference for Long-Range Goals	2A, 19, and 25
Availability of a Strong Support Person	21, 30, and 31
Successful Leadership Positions	3A, 20, and 23
Demonstrated Community Service	3B and 22
Knowledge Acquired in a Field	2B and 3C

During the scoring process, a numerical value based on scoring guidelines was assigned to each open-ended response made by a participant. A mean score was calculated for NCQ items with more than one response and the mean was then rounded to the nearest whole number. The scoring key utilizes complex algorithms. The range of scores for each

noncognitive variable is provided in Table 2. A high score indicates strength for the particular noncognitive variable.

Table 2

Highest and Lowest Possible Scores for the Noncognitive Variable Profile Scores

Noncognitive Variable	Lowest Possible Score	Highest Possible Score
Positive Self-Concept	7	27
Realistic Self-Appraisal	4	14
Understands and Deals with Racism	5	25
Preference for Long-Range Goals	3	13
Availability of a Strong Support Person	3	15
Successful Leadership Positions	3	13
Demonstrated Community Service	2	8
Knowledge Acquired in a Field	2	6

A team of graduate students scored each participant's NCQ individually and scores were recorded in a password protected Excel spreadsheet. Every NCQ score was reviewed at least twice for accuracy. The Excel spreadsheet was programmed to automatically calculate the profile scores for each noncognitive variable utilizing the scoring criteria from Sedlacek's (1990) *Scoring Key for Supplementary Admissions Questionnaire II.* The team worked in pairs to ensure that each NCQ was scored twice independently. Then, the scorers reviewed the scores and worked to achieve a 100% interrater agreement.

Lockett (1980) reported coefficient alpha reliabilities ranging from .54 to .73 for scales on the modified NCQ (as cited in Tracey & Sedlacek, 1984). Woods and Sedlacek (1988)

reported six out of the eight NCQ scales as having construct validity. The two scales that needed further study were (a) Understands and Deals with Racism and (b) Successful Leadership Positions. Ting and Sedlacek (2000) found construct validity for all but one NCQ scale, Demonstrated Community Service. Tracey and Sedlacek (1984) and Arbona and Novy (1990) used principle component factors analysis to examine the factor structure of the NCQ and found similar factor structure of the NCQ for both White and African-American ethnic groups. In fact, Arbona and Novy (1990) suggested that five of the NCQ factors (Perseverance, Leadership, Support for academic plans, Certainty for Academic Plans and Community Involvement) were similar across three ethnic samples: African American, Mexican-American, and Caucasian. Numerous studies have been conducted to determine the reliability and validity of the NCQ for female students (Ancis & Sedlacek, 1995); international students (Boyer & Sedlacek, 1989); student-athletes (Sedlacek & Adams-Gaston, 1992); Hispanic students (Fuertes & Sedlacek, 1995); Asian Americans (Fuertes, Sedlacek, & Liu, 1994; Ting, 2000); nontraditional students (Sedlacek, 1991); and race, specifically White and Black students (Tracey & Sedlacek, 1984).

Tracey and Sedlacek (1984) reported test-retest reliability coefficients ranging from .70 to .94 for each item of the NCQ, with a median value of .85. Consistently, interjudge agreement on the open-ended items of the NCQ has ranged from .83 to 1.00 (Washington, 1996). The item variables were rated by three judges and the range was reported with academic relatedness of goals ($r = .83$), degree of difficulty of the listed accomplishments ($r = .88$), long-range goals ($r = .89$), leadership ($r = .89$), community involvement ($r = .94$), academic relatedness of activities ($r = .98$), and overall number of outside activities ($r = 1.00$)

(Tracey & Sedlacek, 1984). Below is a review of the noncognitive variables (possible score ranges and the number of items for each variable are in parenthesis):

1. Positive Self-Concept (7 to 27; *n* = 6): A successful individual felt confident in his or her ability to graduate regardless of the obstacles that may arise. The individual expected to do well in both academic and nonacademic areas and made positive statements about his or herself and assumes an ability to handle any challenges that may come his or her way. There is a high level of self-efficacy and self-esteem.
2. Realistic Self-Appraisal (4 to 14; *n* = 3): The individual was able to recognize and accept background academic deficiencies while working toward personal development. The individual recognized criticism or rewards as logical consequences of performance, even though evaluations can be biased.
3. Understands and Deals with Racism (5 to 25; *n* = 5): The individual has a realistic view of racism based on personal experience and understood the role of the system in his or her life and how the system impacts minority individuals. The individual had developed a method of assessing and responding to cultural or racial demands. Similarly, the individual did not blame others for his or her own struggles and reacted to injustice when appropriate.
4. Preference for Long-Range Goals (3 to 13; *n* = 3): The individual could set goals and progress in a timely manner without reinforcement. The individual was able to exhibit patience and accept partial fulfillment of a longer term goal over a period of time. The individual had a future and a past orientation allowing the

individual to look beyond the immediate situation to the benefits of planning for long term academic and non-academic goals.

5. Availability of a Strong Support Person (3 to 15; *n* = 3): The individual was able recognize when he or she needed help and was willing to ask for help. The individual has identified at least one individual who provided support and encouragement on a regular basis. The individual also recognized the difficulties inherent in being a loner and rarely relied solely on his or her own resources to address problems.
6. Successful Leadership Positions (3 to 13; *n* = 3): The individual has experience in leadership positions and has influenced and assisted others in both academic and nonacademic situations. The individual was comfortable providing advice and mediation to peers. Similarly, the individual had no problem taking appropriate action when a situation called for action.
7. Demonstrated Community Service (2 to 8; *n* = 2): The individual identified with a cultural, geographic and/or racial group that has a specific and long-term relationship within the community. Similarly, the individual had a history of involvement in community based activities and/or organizations that have accomplished specific goals in the community setting.
8. Knowledge Acquired in a Field (2 to 6; *n* = 2): The individual had nontraditional, culturally and/or racially based experience and knowledge regarding a field or area that may or may not have been formally studied in school. Also, the individual has developed innovative and creative ways in which to acquire information about a particular area.

Data Analysis

The statistical analyses chosen for this study are consistent with previous retention studies that have examined the predictive ability of multiple independent variables of academic success and persistence (Boyer & Sedlacek, 1989; Carmicheal et. al, 1986; Jenkins, 2000; Hood, 1992; House, 1994; Pickering et al., 1992; Ting & Sedlacek, 2000; Tracey & Sedlacek, 1984). The investigator used several types of analysis in this study including descriptive statistics, Analysis of Covariance (ANCOVA), and logistic regression with interactions. Descriptive statistics compared the two institutions in regard to sample size, Spring 2004 GPA, and enrollment status and reported the frequency distribution for the means and standard deviations of the eight NCQ items as well as for the two dependent variables of academic success (Spring 2004 GPA) and persistence (enrollment status). An alpha level ($p<.05$) was set in order to determine statistical significance of the results.

Research Question 1

The investigator used Analysis of Covariance (ANCOVA) to determine whether noncognitive variables predict academic success of African-American students differently at a public PWI versus a public HBCU. Spring 2004 GPA was utilized to measure academic success. NC A&T uses a 0 to 4.00 GPA scale; whereas, NCSU uses a 0 to 4.33 scale. However, no adjustment to GPAs were necessary because the NCSU registrar adjusts the GPAs to the standard 4.00 scale prior to reporting a student's GPA on the student's transcript.

The investigator utilized PROC GLM in SAS® (SAS Institute, 2001; Version 8.02) to run an ANCOVA to analyze Spring 2004 GPA as the dependent variable and the noncognitive variable profile scores and the interaction of each noncognitive variable with

institution type as the independent variables. ANCOVA was used "to test the main and interaction effects of categorical variables on a continuous dependent variable, controlling for the effects of selected other continuous variables which covary with the dependent" variable (Garson, n.d., ANCOVA, ¶ 1). The investigator utilized the institution type as the covariate. This process resulted in a multiple linear regression with interactions that allowed the investigator to examine if the continuous independent variables (noncognitive variables and their interaction terms with institution) have effects on the dependent variable (Spring 2004 GPA) once differences (institution type) between the pre-existing groups had been statistically controlled. By using ANCOVA, the investigator was able to determine the difference in significance of each noncognitive variable between the two institutions.

Research Question 2

Next, the investigator used logistic regression with interactions to determine whether noncognitive variables predict college persistence of African-American students differently at a public PWI versus a public HBCU. The investigator utilized PROC LOGISTIC in SAS® (SAS Institute, 2001; Version 8.02) to run a logistic regression with interactions to analyze Enrollment as the dependent variable and the noncognitive variable profile scores and the interaction of each noncognitive variable with institution type as the independent variables. Enrollment was coded as 1 for continued enrollment and 0 for discontinued enrollment at the same institution. The investigator coded each institution (NC A&T = 0 and NCSU = 1). Since the dependent variable is discrete, a logistic regression model was used to estimate the noncognitive variables and interaction terms which influence enrollment. According to Garson (n.d.), the significance of the interaction with the noncognitive variable is the significance of change in R^2_L of the equation with the interaction terms.

CHAPTER 4

RESULTS

This chapter reports the results of the study which examined whether noncognitive variables predict academic success and persistence of African-American students differently at a public PWI versus a public HBCU. All statistical procedures were conducted using the SAS® (SAS Institute, 2001; version 8.02) statistical program. Descriptive statistics for the independent and dependent variables are presented first. Then, the results related to the two research questions will be presented.

Descriptive Statistics for Independent and Dependent Variables

The average age of the participants was 19.23 years of age, with a range of 17 years of age to 44 years of age. Fifty-eight participants (9.7%) were from the PWI and 538 participants (90.3%) were from the HBCU. The sample utilized Spring 2004 GPA and the overall mean for Spring 2004 GPA was 2.22. African-American students attending the HBCU had lower Spring 2004 GPAs (M = 2.17; SD = 1.05) than their counterparts who attended the PWI (M = 2.64; SD = 0.79). The enrollment statistics for the two institutions were similar. Approximately, 498 (92.6%) students at the HBCU continued enrollment and 40 (7.4%) students discontinued enrollment. Similarly, 53 (91.4%) of the students at the PWI continued enrollment and 5 (8.6%) of the students at the PWI discontinued enrollment. Table 3 presents the results regarding Spring 2004 GPA, and Table 4 presents the results regarding enrollment for Spring 2004.

Table 3

Descriptive Statistics for Spring 2004 GPA

Variable	*N*	Mean	SD
Spring 2004 GPA	596	2.22	1.04
HBCU	538	2.17	1.05
PWI	58	2.64	0.79

Note. HBCU – Historically Black College or University; PWI = Predominantly White Institution

Table 4

Descriptive Statistics for Spring 2004 Enrollment

Spring 2004 Enrollment	*N*
Overall Sample	596
Continued Enrollment = 1	551
Discontinued Enrollment = 0	45
HBCU	538
Continued Enrollment = 1	498
Discontinued Enrollment = 0	40
PWI	58
Continued Enrollment = 1	53
Discontinued Enrollment = 0	5

Note. HBCU – Historically Black College or University; PWI = Predominantly White Institution

Eight noncognitive profile scores were calculated for each of the 596 participants. Table 5 presents these results. Positive Self-Concept scores ranged from 9 to 25 with a mean of 19.09 and a standard deviation of 2.24. Realistic Self-Appraisal scores ranged from 4 to 14 with a mean of 10.56 and a standard deviation of 1.77. Understands and Deals with Racism scores ranged from 8 to 25 with a mean of 17.86 and a standard deviation of 2.24. Preference for Long-Range Goals scores ranged from 3 to 13 with a mean of 9.21 and a standard deviation of 1.58. Availability of a Strong Support Person scores ranged from 6 to 15 with a mean of 13.91 and a standard deviation of 1.45. Successful Leadership Positions scores ranged from 5 to 13 with a mean of 9.90 and a standard deviation of 1.39. Demonstrated Community Service scores ranged from 2 to 8 with a mean of 5.29 and a standard deviation of 1.09. Knowledge Acquired in a Field scores ranged from 2 to 6 with a mean of 4.25 and a standard deviation of 0.75.

Table 5

Descriptive Statistics for Overall Sample by Noncognitive Variable

Noncognitive Variable	Mean	SD
Positive Self-Concept	19.09	2.24
Realistic Self-Appraisal	10.56	1.77
Understands and Deals with Racism	17.86	2.24
Preference for Long-Range Goals	9.21	1.58
Availability of a Strong Support Person	13.91	1.45
Successful Leadership Positions	9.90	1.39
Demonstrated Community Service	5.29	1.09
Knowledge Acquired in a Field	4.25	0.75

The means and standard deviations for each noncognitive variable profile vary by institution. Table 6 presents the means and standard deviations for each noncognitive profile by institution type. Students attending the HBCU demonstrated a higher mean profile score for Positive Self-Concept (M = 19.55; SD = 2.37) than their counterparts who attended the PWI (M = 14.87; SD = 2.13). The scores for Realistic Self-Appraisal for students attending the HBCU (M = 10.65; SD = 1.72) and students attending the PWI (M = 9.74; SD = 2.00) were much closer. Students attending the HBCU had higher profile scores for Understands and Deals with Racism (M = 18.20; SD = 1.98) than students attending the PWI (M = 14.69; SD = 2.01). The scores for Availability of a Strong Support Person for students attending the HBCU (M = 13.89; SD = 1.48) and students attending the PWI (M = 14.03; SD = 1.17) were similar as were the profile scores for Successful Leadership Positions for students attending the HBCU (M = 9.90; SD = 1.39) and students attending the PWI (M = 9.86; SD = 1.37). The profile scores for Preference for Long-Range Goals and Demonstrated Community Services for students attending the HBCU (M = 9.26, SD = 1.56; M = 5.25, SD = 1.07 respectively) and students attending the PWI (M = 8.79, SD = 1.74; M = 5.71, SD = 1.20) varied slightly. Finally, the profile scores for Knowledge Acquired in a Field for students attending the HBCU (M = 4.22; SD = 0.73) and students attending the PWI (M = 4.48; SD = 0.93) were very close.

Table 6

Means and Standard Deviations by Institutions

Noncognitive Variable	HBCU		PWI	
	Mean	SD	Mean	SD
Positive Self-Concept	19.55	2.37	14.87	2.13
Realistic Self-Appraisal	10.65	1.72	9.74	2.00
Understands and Deals with Racism	18.20	1.98	14.69	2.01
Preference for Long-Range Goals	9.26	1.56	8.79	1.74
Availability of a Strong Support Person	13.89	1.48	14.03	1.17
Successful Leadership Positions	9.90	1.39	9.86	1.37
Demonstrated Community Service	5.25	1.07	5.71	1.20
Knowledge Acquired in a Field	4.22	0.73	4.48	0.93

Note. HBCU = Historically Black College or University; PWI = Predominantly White Institution

In order to determine significant relationships among the variables, Pearson Correlation Coefficients were computed including institution, Spring 2004 GPA, Spring 2004 enrollment, and the eight noncognitive variable profiles. Of the possible 55 bivariate correlations, 20 correlations were significant at $p<.0001$ and 11 were significant at $p<.05$. Table 7 presents the intercorrelations among institution, Spring 2004 GPA, Spring 2004 enrollment, and the eight noncognitive variable profiles.

Initially, there was a concern with multicollinearity in this model. As Agresti and Finlay (1997) note in their text, one would gain little from adding explanatory or predictive variables to a model that are strongly correlated with the variables already in the model

because R^2 would not increase much. Therefore, one should use explanatory or predictive variables that have weak correlations with one another but strong correlations with the dependent variable(s). However, as noted by Agresti and Finlay (1997) "[i]n practice, this is not always possible, especially if we want to include certain variables in the model for theoretical reasons" (p. 398). Although multicollinearity impacts the ability to assess partial effects, it does not interfere with the interpretation of the main effect. However, in this study, the interest is in the partial effects of the individual variables and if the effects differ between institution type.

The results revealed that several of the noncognitive variables were correlated to one another. Positive Self-Concept was correlated to Realistic Self-Appraisal (0.45817; p <.0001); Understands and Deals with Racism (0.40485; p <.0001); Preference for Long-Range Goals (0.31747; p <.0001); Availability of a Strong Support Person (0.19339; p <.0001); Successful Leadership Positions (0.24872; p<.0001); and Demonstrated Community Service (.08661; p <.05). In addition, Realistic Self-Appraisal was correlated to Understands and Deals with Racism (0.19972; p<.0001); Preference for Long-Range Goals (0.21513; p <.0001); Availability of a Strong Support Person (0.16604; p <.0001); Successful Leadership Positions (0.18006; p <.0001); and Demonstrated Community Service (0.09262; p <.05). Likewise, Understands and Deals with Racism was also correlated with Preference for Long-Range Goals (0.11354; p <.05); Availability of a Strong Support Person (0.17248; p <.0001) and Successful Leadership Positions (0.15853; p <.0001). Preference for Long-Range Goals was correlated with Availability of a Strong Support Person (0.13986; p <.05); Successful Leadership Positions (0.14043; p <.05); Demonstrated Community Service (0.19434; p <.0001); and Knowledge Acquired in a Field (0.28949; p <.0001). Additionally,

Availability of a Strong Support Person was also correlated with Successful Leadership Positions (0.21012; p <.0001); Demonstrated Community Service (0.21909; p <.0001); and Knowledge Acquired in a Field (0.02914; p <.05). Successful Leadership Positions was also correlated with Demonstrated Community Service (0.15352; p <.0001) and Knowledge Acquired in a Field (0.08659; p <.05). Demonstrated Community Service was also correlated with Knowledge Acquired in a Field (0.03583; p <.05). After consulting with a statistical professor, the investigator determined that the correlations between the variables were not high enough for there to be significant concern with multicollinearity (P. Bloomfield, personal communication, February, 17, 2005).

A positive correlation was identified between Demonstrated Community Service and Spring 2004 GPA (0.10838; p <.05). The amount of variance accounted for between Demonstrated Community Service and Spring 2004 GPA was approximately 1% (R^2 = 0.0117, p <.05). No other noncognitive variables were significantly correlated with either Spring 2004 GPA or enrollment status.

Table 7

Intercorrelations among Institution Type, Spring 2004 GPA, Spring 2004 Enrollment, and Eight Noncognitive Variables

	PSC	RSA	UDR	PLRG	ASSP	SLE	DCS	KAF	Spr_04_GPA	Enrollment	Institution
PSC	1.0000	0.45817**	0.40485**	0.31747**	0.19339**	0.24872**	0.08661*	0.02675	-0.05268	-0.01038	-0.50754**
RSA		1.0000	0.19972**	0.21513**	0.16604**	0.18006**	0.09262*	0.06155	0.00970	0.00133	-0.15307*
UDR			1.0000	0.11354*	0.17248**	0.15853**	0.05917	-0.05553	-0.06427	-0.01779	-0.46537**
PLRG				1.0000	0.13986*	0.14043*	0.19434**	0.28949**	0.02306	0.06391	-0.09768
ASSP					1.0000	0.21012**	0.21909**	0.02914*	-0.03325	-0.03134	0.02872
SLE						1.0000	0.15952**	0.08659*	0.00023	0.03253	-0.00901
DCS							1.0000	0.03583*	0.10838*	0.00786	0.12476
KAF								1.0000	0.08110	0.00373	0.10102
Spr_04_GPA									1.0000	0.25579**	0.13265*
Enrollment										1.0000	-0.01330
Institution											1.0000

Note. ** $p<.0001$; *$p<.05$

PSC= Positive Self-Concept; RSA=Realistic Self-Appraisal; UDR=Understand and Deals with Racism; PLRG=Preference for Long-Range Goals; ASSP=Availability of a Strong Support Person; SLE=Successful Leadership Positions; DCS=Demonstrated Community Service; KAF=Knowledge Acquired in a Field

Research Question 1

The first research question examined if noncognitive variables predict academic success for African-American students differently at a PWI versus a HBCU. The investigator utilized PROC GLM in SAS® (SAS Institute, 2001; version 8.02) to run an ANCOVA to analyze Spring 2004 GPA as the dependent variable, the noncognitive variable profile scores and the interaction of each noncognitive variable with institution type as the independent variables, and institution as the covariate. The correlation between Spring 2004 GPA and institution was significant at the $p < .01$ level.

Table 8 presents the initial results of the ANCOVA for the first research question. The fit of the model was very poor with an R^2 of only 0.0419 and the *p*-value of the *F* test of the regression of this model was only 0.0934. Therefore, the model only accounts for 4% of the variance in Spring 2004 GPA, and the investigator cannot be confident that there is any difference between African-American students at NCSU versus NC A&T. However, the investigator recognized that the fit of the model was low because of the absence of the standard cognitive factors such as SAT scores and high school GPA which are known to account for a majority of the variance in college GPA.

Since this study's purpose was to see if noncognitive variables predict academic success for African-American students differently at a PWI versus a HBCU and not to necessarily create the best predication equation, the investigator utilized a backward stepwise ANCOVA to eliminate variables that were not significant. The backward elimination process involves placing all the explanatory variables in the model and then "deleting one at a time from the model until reaching a point where the remaining variables all make significant partial contributions to predicting *Y*" (Agresti & Finley, 1997, p. 529). The goal is

to remove variables that explain the least variation in Spring 2004 GPA and result in the smallest decrease in R^2.

Table 8

ANCOVA Comparing Noncognitive Profiles of African-American Students (Full Model)

Variable	df	*F*	*p*
Positive Self-Concept	1, 595	1.67	0.1962
Realistic Self-Appraisal	1, 595	0.87	0.3501
Understands and Deals with Racism	1, 595	1.37	0.2425
Preference for Long-Range Goals	1, 595	0.87	0.3503
Availability of a Strong Support Person	1, 595	0.39	0.5348
Successful Leadership Positions	1, 595	0.15	0.6995
Demonstrated Community Service	1, 595	7.77	0.0055*
Knowledge Acquired in a Field	1, 595	3.09	0.0795**
Positive Self-Concept*Institution	1, 595	4.86	0.0278*
Realistic Self-Appraisal*Institution	1, 595	1.04	0.3093
Understands and Deals with Racism*Institution	1, 595	0.72	0.3968
Preference for Long-Range Goals*Institution	1, 595	0.02	0.9017
Availability of a Strong Support Person*Institution	1, 595	0.36	0.5497
Successful Leadership Positions*Institution	1, 595	1.17	0.2807
Demonstrated Community Service*Institution	1, 595	0.08	0.7820
Knowledge Acquired in a Field*Institution	1, 595	0.04	0.8378
Institution	1,595	0.82	0.3663

Note. *p<.05; **p<.10

Table 9 presents the steps and results of the backward elimination. The first model contained all noncognitive variables and the interaction terms for each noncognitive variable and institution. The R^2 for the initial model was 0.0419. The investigator eliminated the following terms in the order presented: Preference for Long-Range Goals*Institution [F (1,595) = 0.02, p =0.9017], Demonstrated Community Service*Institution [F (1,595) = 0.00, p = 0.9615], Knowledge Acquired in a Field*Institution [F (1,595) = 0.04, p =0.8440], Availability of a Strong Support Person*Institution [F (1,595) = 0.27, p = 0.6003], Successful Leadership Positions*Institution [F (1,595) = 0.23, p = 0.6300], Successful Leadership Positions [F (1,595) = 0.15, p = 0.6987], Availability of a Strong Support Person [F (1,595) = 0.39, p =0.5334], Understands and Deals with Racism*Institution [F (1,595) = 0.60, p = 0.4373], Preference for Long-Range Goals [F (1,595) = 0.02, p = 0.8844], Realistic Self-Appraisal*Institution [F (1,595) = 0.99, p = 0.3193], Realistic Self-Appraisal [F (1,595) = 0.88, p = 0.3486], and Understands and Deals with Racism [F (1,595) = 1.34, p = 0.2475].

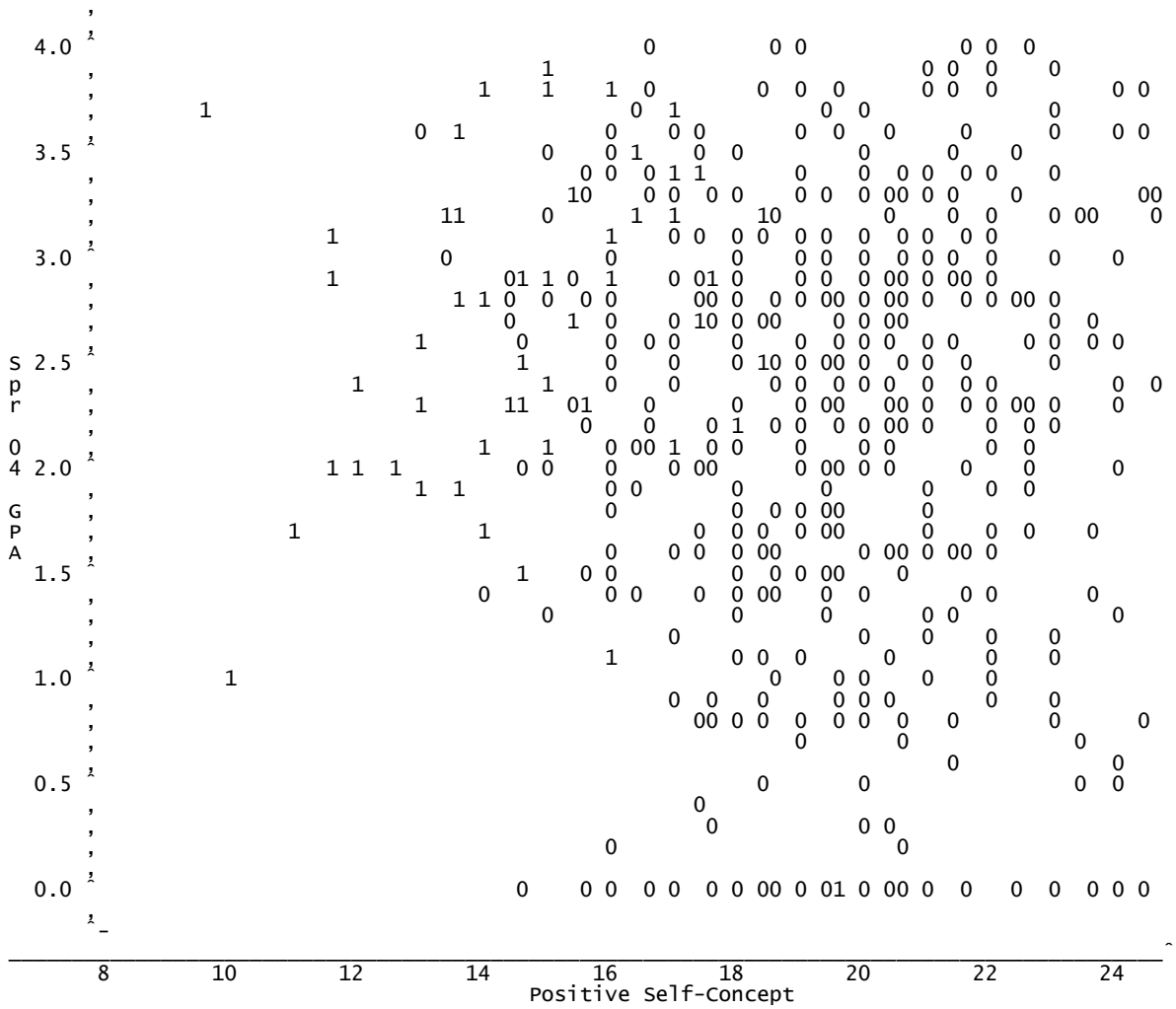
The final model had an R^2 of 0.03. The predicted main effect for the remaining noncognitive variables and one interaction between a noncognitive variable and institution type was significant at the p <.01 level. The Demonstrated Community Service variable was significant [F (1,595) = 7.82, p <.01] for the whole sample. Similarly, the Knowledge Acquired in a Field variable was significant [F (1,595) = 3.78, p <.10] for whole sample though at a lower significance level. The Positive Self-Concept variable [F (1,595) = 1.69, p = 0.1942], though not significant, had to remain in the final model because the interaction term of Positive Self-Concept and institution was significant [F (1,595) = 5.34, p <.05]. The interaction of Positive Self-Concept and institution was the only significant interaction term between noncognitive variable and institution when predicting academic success.

Table 9

Steps for ANCOVA with Backward Elimination

Step	Model R^2	Least Significant Variable	*F*	*p*
1	0.041898	Preference for Long-Range Goals*Institution	0.02	0.9017
2	0.041628	Demonstrated Community Service*Institution	0.00	0.9615
3	0.041483	Knowledge Acquired in a Field*Institution	0.04	0.8440
4	0.041114	Availability of a Strong Support Person*Institution	0.27	0.6003
5	0.040722	Successful Leadership Positions*Institution	0.23	0.6300
6	0.038887	Successful Leadership Positions	0.15	0.6987
7	0.038692	Availability of a Strong Support Person	0.39	0.5334
8	0.035166	Understands and Deals with Racism*Institution	0.60	0.4373
9	0.032998	Preference for Long-Range Goals	0.02	0.8844
10	0.031223	Realistic Self-Appraisal*Institution	0.99	0.3193
11	0.031223	Realistic Self-Appraisal	0.88	0.3486
12	0.030831	Understands and Deals with Racism	1.34	0.2475
13	0.030634	--	--	--

Additionally, the plot graph presented in Figure 1 indicates the Positive Self-Concept has a stronger relationship with Spring 2004 GPA at the PWI (NCSU = 1) than the HBCU (NC A&T = 0). Positive Self-Concept and Spring 2004 GPA demonstrated a positive correlation for the PWI on the plot graph; whereas, there is no clear relationship between Positive Self-Concept and Spring 2004 GPA at the HBCU. The remaining noncognitive variables did not interact significantly with institution.



Note.173 obs hidden. Symbol is value of Institution (PWI = 1; HBCU = 0). Produced with SAS® (SAS Institute, 2001; Version 8.02).

Figure 1 - *Plot graph of the interaction between Spring GPA and Positive Self-Concept*

Research Question 2

The second research question examined if noncognitive variables predict college persistence for African-American students differently at a PWI versus a HBCU. The investigator utilized PROC LOGISTIC in SAS® (2001; Version 8.02) to run a logistic regression with interactions to analyze Enrollment as the dependent variable and the noncognitive variable profile scores and the interaction of each noncognitive variable with institution type as the independent variables. Enrollment was coded as 1 for continued enrollment and 0 for discontinued enrollment at the same institution. Since the dependent variable is discrete, a logistic regression model was used to estimate the noncognitive variables and interaction terms which influence enrollment.

Table 10 presents the initial results of the full model for the logistic regression for the second research question. The first step was to test and describe the overall goodness of fit of the model. Unfortunately, SAS® (SAS Institute, 2001; version 8.02) was unable to determine the maximum likelihood estimate and warned that the validity of the model fit may be questionable. This limitation may have been a result of the high number of independent variables (n = 17) included in the original model. Since the purpose of this study was exploratory to determine if noncognitive variables predict college persistence for African-American students differently at a PWI versus a HBCU and not to necessarily create the best prediction equation, the investigator continued to examine the model utilizing SAS® (SAS Institute, 2001; version 8.02) despite possible limitations.

Table 10

Logistic Regression of Noncognitive Profiles of African-American Students (Full Model)

Variable	df	Wald X^2	Pr > X^2
Positive Self-Concept	1, 595	0.0060	0.9380
Realistic Self-Appraisal	1, 595	0.0930	0.7604
Understands and Deals with Racism	1, 595	0.9415	0.3319
Preference for Long-Range Goals	1, 595	2.6256	0.1052
Availability of a Strong Support Person	1, 595	1.4488	0.2287
Successful Leadership Positions	1, 595	0.0237	0.8778
Demonstrated Community Service	1, 595	0.0142	0.9051
Knowledge Acquired in a Field	1, 595	1.8334	0.1757
Positive Self-Concept*Institution	1, 595	0.0048	0.9449
Realistic Self-Appraisal*Institution	1, 595	0.0026	0.9597
Understands and Deals with Racism*Institution	1, 595	0.0048	0.9446
Preference for Long-Range Goals*Institution	1, 595	0.0331	0.8557
Availability of a Strong Support Person*Institution	1, 595	0.2067	0.6494
Successful Leadership Positions*Institution	1, 595	0.2453	0.6204
Demonstrated Community Service*Institution	1, 595	0.1578	0.6912
Knowledge Acquired in a Field*Institution	1, 595	0.8049	0.3696
Institution	1, 595	0.0369	0.8477

Agresti and Finlay (1997) recommend for a small to moderate sample size that "the likelihood-ratio statistic often…provides a more powerful test than the Wald statistic" (p. 582) which is used in larger sample studies. In the full model with all the noncognitive variables and the interaction terms of each noncognitive variable and institution, the likelihood-ratio test statistic denoted by -2 Log Likelihood equaled 319.035 with $df = 17$ and a p-value of $p < .01$. According the Menard (2001), the larger the -2 Log Likelihood statistic, the weaker the prediction of the dependent variable.

In light of the questionable validity of the full model with all the variables, the investigator utilized backward elimination to eliminate variables that were not significant. The backward elimination process involves placing all the explanatory variables in the model and then removing variables that did not add significantly to the model. Backward stepwise logistic regression "utilizes chi-square difference to determine automatically which variables to add or drop from the model"….and "is considered useful only for exploratory purposes" (Garson, n.d., Logistic Regression, ¶ 22). Table 11 presents the steps of the backward elimination.

Table 11

Steps for Backward Logistic Regression

Step	-2 Log Likelihood	Model X^2	Effect Removed	Pr > X^2
Initial	319.035	--	--	--
1	278.408	40.6272	Realistic Self-Appraisal*Institution	0.9597
2	278.327	40.7084	Positive Self-Concept*Institution	0.9684
3	278.320	40.7151	Positive Self-Concept	0.9377
4	278.326	40.7091	Realistic Self-Appraisal	0.7662
5	278.415	40.6209	Understands and Deals with Racism*Institution	0.7368
6	278.424	40.6112	Availability of a Strong Support Person*Institution	0.4746
7	278.683	40.3529	Understands and Deals with Racism	0.3186
8	279.683	39.3526	Preference for Long-Range Goals*Institution	0.2229
9	287.029	32.0065	Demonstrated Community Service*Institution	0.2092
10	289.115	29.9208	Demonstrated Community Service	0.5805
11	289.426	29.6091	Availability of a Strong Support Person	0.1243
12	292.234	26.8011	Preference for Long-Range Goals	0.1674
13	294.118	24.9175	--	--

Note. *$p \leq .0001$; **$p < .05$

In logistic regression, the Model X^2 is not only analogous to the multivariate *F* test, but also to the regression sum of squares (SSR) (i.e. SSR = SST – SSE) (Menard, 2001). If the Model X^2 is statistically significant, then the null hypothesis can be rejected and the investigator may conclude that the noncognitive variables contribute to predicting persistence and if any of the interaction terms of noncognitive variable with institution are significant, then the investigator can conclude that the significant variable predicts differently at the PWI

versus the HBCU. In the final model, the Model X^2 is statistically significant at the 0.0001 alpha level.

Similarly, R^2 in linear regression is comparable to R^2_L in logistic regression (Menard, 2001). R^2_L is determined by dividing the Model X^2 by the Initial Log Likelihood Function -2 Log Likelihood. Table 12 presents the R^2_L values for the backward stepwise logistic regression. The R^2_L (0.0781) of the final model demonstrates a small association between persistence and two noncognitive variables and their corresponding interaction terms. In the final model, Successful Leadership Positions, Knowledge Acquired in a Field, Successful Leadership Positions*Institution, Knowledge Acquired in a Field*Institution, and Institution are associated with persistence of African American students in the study.

Table 12

Backward Stepwise Logistic Regression -2 Log Likelihood, Model X^2, and R^2_L values

Step	-2 Log Likelihood	Model X^2	R^2_L
Initial	319.035	--	--
1	278.408	40.6272	0.1273
2	278.327	40.7084	0.1276
3	278.320	40.7151	0.1276
4	278.326	40.7091	0.1276
5	278.415	40.6209	0.1273
6	278.424	40.6112	0.1273
7	278.683	40.3529	0.1265
8	279.683	39.3526	0.1233
9	287.029	32.0065	0.1003
10	289.115	29.9208	0.0938
11	289.426	29.6091	0.0928
12	292.234	26.8011	0.0840
13	294.118	24.9175	0.0781

After Step 8 of the backward stepwise logistic regression, SAS® (SAS Institute, 2001; version 8.02) was able to determine the maximum likelihood estimate. Table 13 summarizes the final model. The following variables were included in the final model: Successful Leadership Positions, Knowledge Acquired in a Field, Successful Leadership Positions*Institution, Knowledge Acquired in a Field*Institution, and Institution. The Model

X^2 equaled 24.9175 with *df* = 5 and a *p*-value of 0.0001. In the final model, the reduction of the -2 Log Likelihood statistic (294.118) from the intercept-only -2 Log Likelihood statistic (319.035) indicates a better prediction of persistence or re-enrollment.

Table 13

Logistic Regression Final Model

Parameter	df	Estimate	SE	Wald X^2	Pr > X^2
Intercept	1, 595	3.8611	1.4925	6.6922	0.0097
Successful Leadership Positions	1, 595	-0.0507	0.1183	0.1839	0.6681
Knowledge Acquired in a Field	1, 595	-0.1955	0.2275	0.7385	0.3901
Successful Leadership Positions*Institution	1, 595	3.5416	1.8446	3.6864	0.0549**
Knowledge Acquired in a Field*Institution	1, 595	2.6510	1.2850	4.2561	0.0391*
Institution	1, 595	-41.5852	19.5263	4.5356	0.0332*

Note. **p*<.05; ***p*<.10

Knowledge Acquired in a Field*Institution was the most significant interaction variable with an estimate of 2.651 which is significant at $p < .05$. Successful Leadership Positions*Institution was significant at $p < .10$ with an estimate of 3.5416. The partial effects for Successful Leadership Positions or Knowledge Acquired in a Field were not significant without the interaction with institution but must be included in the final prediction model because their interaction terms are included in the final model. Considering the model's estimates for each interaction term of noncognitive variable with institution, Successful Leadership Positions and Knowledge Acquired in a Field, appear to be much more

significant at NCSU (Institution = 1) than at NC A&T (Institution=0). Overall, each additional point in a student's score for Knowledge Acquired in a Field had the effect of multiplying the estimated odds of the student re-enrolling at NCSU by $e^{2.4555} = 11.65$. Likewise, each additional point in a student's score for Successful Leadership Positions had the effect of multiplying the estimated odds of the student re-enrolling at the NCSU by $e^{3.4909} = 32.82$. In fact, the parameter estimates for Successful Leadership Positions and Knowledge Acquired in a Field at NC A&T were actually negative and indicate that these variables have significantly less impact on a student's estimated odds for re-enrolling at NC A&T. Overall, each additional point in a student's score for Knowledge Acquired in a Field had the effect of multiplying the estimated odds of the student re-enrolling at NC A&T by $e^{-0.0507} = 0.95$. Likewise, each additional point in a student's score for Successful Leadership Positions had the effect of multiplying the estimated odds of the student re-enrolling at the NC A&T by $e^{-0.1955} = 0.85$.

CHAPTER 5

DISCUSSION

The purpose of this exploratory study was to examine whether noncognitive variables predict academic success and persistence of African-American students differently at a public PWI versus a public HBCU during the students' first year. Specifically, the study sought to answer two research questions. First, do noncognitive variables predict academic success for African-American students differently at a PWI versus a HBCU? Second, do noncognitive variables predict college persistence for African-American students differently at a PWI versus a HBCU? The dependent variables were Spring 2004 GPA (academic success) and enrollment status (persistence). The independent variables were the noncognitive variables and their interaction terms with institution type.

This chapter will examine the study's results, limitations and future implications. The first section will address the research findings. The second section will discuss the results, and the third section will present the limitations of the study. Finally, the last section will examine implications for future research and practice.

Research Findings

In this study, Chapter 4 presented the results of a correlation between independent and dependent variables (Table 7), a backward stepwise ANCOVA predicting academic success as defined by Spring 2004 GPA (Tables 8 - 9), and a backward stepwise logistic regression examining persistence as defined by enrollment status in Spring 2004 (Tables 10 - 13). The sample included 58 (9.7%) African-American students from the PWI and 538 (90.3%) African-American students from the HBCU. The students at the HBCU had a lower Spring GPA (M = 2.17) than the students at the PWI (M = 2.64). Approximately, 498

(92.6%) students at the HBCU continued enrollment and 40 (7.4%) students discontinued enrollment. Similarly, 53 (91.4%) of the students at the PWI continued enrollment and five (8.6%) of the students at the PWI discontinued enrollment.

Overall, the majority of the noncognitive variables as measured by the NCQ did not differ significantly between the PWI and the HBCU during the spring semester. However, the interaction term of Positive Self-Concept and institution type did differ for academic success between the two institution types. Positive Self-Concept was more significant at the PWI than the HBCU. This indicates that the expectations African-American students at NCSU have regarding their ability to do well and handle new situations in the college environment were predictive of Spring 2004 GPA at the PWI. However, there is a potential risk of restriction of range with this particular variable particularly at the HBCU which had a mean score for Positive Self-Concept of 19.54 out of a highest possible score of 27. Then again, the higher Positive Self-Concept for African-American students at a HBCU versus African-American students at a PWI has been documented by several other authors (Clawson, 1983; Dartson, 1998). In fact, Sedlacek (2004) found that having a positive self-concept was important for any student, "but it becomes even more so for those with nontraditional experiences because of the added complexity of dealing with a system that was not designed for them" (p. 39). Likewise, Berger and Milem (2000) and Fries-Britt and Turner (2002) found that the self-concept of successful African-American students was improved at HBCUs while African-American students at PWIs had to learn to cope with threats to their self-concept. Similarly, several authors noted that HBCUs seem to promote an atmosphere of ethnic pride and consciousness, which is crucial in the development of self-esteem and a sense of self-worth (Dartson, 1998; Gurin & Epps, 1975). Overall, several

studies regarding noncognitive variables have found Positive Self-Concept to be predictive of academic success during the first year (Gerardi, 1990, Johnson, 1993; Ting & Robinson, 1998; Tracey & Sedlacek, 1984, 1985; Washington, 1996).

Knowledge Acquired in a Field differed significantly for college persistence between the two institution types and was significant in predicting academic success for the whole sample. Knowledge Acquired in a Field was more significant for African-American students at the PWI than the HBCU. Sedlacek (2004) noted that minority students "who have shown evidence of nontraditional learning prior to college tend to be more successful in college than those who show no such evidence" (p. 49). Successful Leadership Positions is also worth noting as well. Although at a lower significance level ($p < .10$), the interaction term of Successful Leadership Positions and institution did appear to predict better at the PWI than the HBCU. Sedlacek (2004) noted that successful minority students have demonstrated the ability to organize and influence others. In fact, the most promising nontraditional students have often shown their leadership ability in a nontraditional manner, such as working in their community or in their church (Allen, 1992). Likewise, Ting (2000) and Ting and Robinson (1998) found Knowledge Acquired in a Field and Successful Leadership Positions to be important predictors among minority students.

In addition, Demonstrated Community Service was significantly correlated with Spring 2004 GPA and was significant [F (1,595) = 7.82, p <.01] for the whole sample in the final regression model predicting academic success. The strong correlation between Demonstrated Community Service and academic success is expected in light of the significance of Positive Self-Concept, Knowledge Acquired in a Field, and Successful Leadership Positions. As Sedlacek (2004) noted, minority students "who are active in a

community learn how to handle the system, exhibit leadership, and develop their self-concept in such groups" (p. 47). According to Tracey and Sedlacek (1984), Demonstrated Community Service not only represents providing service to a community but also having a sense of belonging to a community. As Dalton (1997) noted even if the community service is not directly related to the college campus, the act of service and sense of belonging will provide the student with a sense of worth and importance. This feeling of worth and belongingness may contribute to academic success as well.

Another notable finding was the fact that Understands and Deals with Racism was not significant at the PWI. The investigator had expected that the African-American students attending a PWI would need to have a high profile score in Understands and Deals with Racism to be successful academically and to persist at the PWI. There are many possible explanations of the phenomenon. First and foremost, the limited sample size of African-Americans at NCSU may have limited the ability to accurately assess the noncognitive variable. Also, African-American students may have not experienced high levels of racism at this particular PWI and further research would be needed to assess the level of racism experienced by African-Americans at the PWI.

At first, the major finding of only three interaction terms, Positive Self-Concept, Knowledge Acquired in a Field, and Successful Leadership Positions, may appear to differ from the available research regarding noncognitive variables and African-American students. However, much of the research regarding noncognitive variables has consistently demonstrated the noncognitive variables' ability to accurately predict the academic success of minority students varies by semester (Ancis & Sedlacek, 1995; Boyer & Sedlacek, 1989; Fuertes & Sedlacek, 1995; Fuertes, Sedlacek, & Liu, 1994; Sedlacek, 1991; Sedlacek &

Adams-Gaston, 1992; Ting, 2000; Ting & Robinson, 1998; Tracey & Sedlacek, 1984). In fact, Tracey and Sedlacek (1987) suggested that cognitive factors tended to be strongest in the first year of college while the noncognitive variables increased in significance over the course of study.

Research Discussion

The results of this study indicated that Positive Self-Concept was significant for academic success (Spring 2004 GPA) for African-American students at the PWI and Knowledge Acquired in a Field and Successful Leadership Positions were significant for persistence (enrollment status) for African-American students at the PWI. Tracey and Sedlacek (1984) noted Positive Self-Concept represents the student's expectation of ability, while Knowledge Acquired in a Field represents the nontraditional knowledge or creative and innovative abilities the student already possesses that may not be academically related and Successful Leadership Positions represents the student's ability to organize and influence others. The findings that these variables are more significant at the PWI than the HBCU were expected given the assumption that the African-American students were a minority at the PWI and would most likely need a positive self-concept, nontraditional knowledge, and demonstrated leadership ability to succeed and persist at a PWI.

One possible explanation for the study's findings relates to integration of the student into the college of choice. For example, Mannan (1986) concluded that the lack of integration into the social environment at PWIs accounts for a significant portion of the lower grades for African-American students attending a commuter college. In addition, Hood (1992) found both noncognitive and social integration factors significant for African-American students. In 1993, Tinto proposed a theory of retention demonstrating a connection

between the degree of integration in college activities and persistence. He defined integration as a social and an academic phenomenon in which the student follows the rules for belonging to the institution and shares a common understanding of values and norms with college faculty and peers. Basically, according to Tinto, the greater the degree of student integration into a campus, the better chance the student has for academic success and persistence. In particular, Tinto noted that students who experience bias or differences in education, such as African-American students at a PWI, may develop a variety of noncognitive responses that allow them to achieve. In fact, the NCQ was developed to identify noncognitive variables of minority students who have experienced bias or discrimination (Lovegreen, 2003).

Therefore, the NCQ should serve as an excellent tool for evaluating minority student's potential for integration since Tinto (1993) theorized that a student's ultimate integration is a direct result of the characteristics and skills a student brings to college. In fact, Tinto argued that integration into a college is a combination of the student's intentions, goals, and expectations he or she brings to the college and it is these pre-college intentions, goals, and expectations which the NCQ measures. Likewise, Tinto's belief that the interaction between the student and institution change over time would also support the noncognitive research indicating that the significance of specific noncognitive variables varies across semesters. According to Tinto, when the interaction between student and institution is positive, the student becomes more integrated into the college campus which encourages the student to succeed and persist throughout college.

For instance, Positive Self-Concept may allow a student to seek out more experiences within the institution and be more likely to engage faculty and peers. Whereas, Knowledge

Acquired in a Field may aid a minority student in being able to demonstrate knowledge nontraditionally and may also facilitate integration by assisting the student in acquiring knowledge in creative or innovative ways especially if the campus climate in not conducive to the student feeling safe in approaching faculty or peers. Successful Leadership Positions may also facilitate integration especially if the student chooses to participate in campus organizations. Any leadership experience on campus will result in greater involvement with the college system as a whole. Therefore, the different campus environments at the PWI versus the HBCUs may influence the significance of noncognitive variables across semesters as the student becomes more or less integrated with the college campus.

Limitations

There are several important limitations to this study that must be taken into consideration. First, the sample size, especially from the PWI (n = 58), is relatively small and participation was voluntary. A larger sample may have elicited much different results and had more statistical power. Also, the sample was drawn from one HBCU and one PWI in the Southeast and may not be representative of other HBCUs or PWIs. The unique characteristics of both the students and the institutions may limit the generalizability of the results. Another limitation was the use of Spring 2004 GPA as a measure of academic success because the African-American students at the two institutions have very different academic experiences at the two types of institutions, and these differences were not accounted for in this study.

Another limitation is the lack of strong results regarding the predictive validity of the noncognitive variables or their interaction with institution type. Previous research has offered much more powerful predictive validity than seen in the current study (Ting, 2000;

Ting & Robinson, 1998; Tracey & Sedlacek, 1984, 1987; Woods & Sedlacek, 1988). However, the majority of the studies to date have been conducted at the same predominantly White state university in the mid-Atlantic region (Ancis & Sedlacek, 1997; Boyer & Sedlacek, 1988; Fuertes & Sedlacek, 1995; Sedlacek & Adams-Gaston, 1989; Tracey & Sedlacek, 1984, 1985, 1987). Similarly, Ting (2000) and Ting and Robinson (1998), though at a different institution, were also conducted at a predominantly White state university in the mid-Atlantic region. Therefore, the similar institutional characteristics could have been a factor in the significance of the results found in these previous studies.

Another potential limitation of this study was limiting the time scope of the study to the second semester of the freshman year. The decision to limit the study to the second semester was in response to concerns regarding first semester and cumulative GPA for the first year. The investigator noted that during the first semester students are more likely to have additional supports such as orientation programs, first year experience courses, and supplementary advising. Similarly, cumulative GPA for the first year could be impacted by these first semester interventions. Therefore, the investigator felt that the spring semester GPA would possibly be a more accurate reflection of a student's ability. Ideally, the study would have examined the students throughout their college experience. This would have allowed for a more comprehensive look at which noncognitive variables were significant during specific semesters and would have allowed for a better comparison of the institutions.

Much of the research to date on noncognitive variables has demonstrated that different noncognitive variables are significant for different semesters. For example, Tracey and Sedlacek (1985) found that Preference for Long-Range Goals was significant in predicting GPA in semesters 1 and 3, that Demonstrated Community Service prior to college

was found to be predictive of GPA for semesters 6 and 8, and that Positive Self-Concept and Realistic Self-Appraisal were predictive of grades for all semesters for minority students at a PWI. Similarly, Ancis and Sedlacek (1997) found that the predictive ability of the noncognitive variables differed by semester for minority females. In their study, Demonstrated Community Service, Realistic Self-Appraisal, and Knowledge Acquired in a Field were significant predictors of GPA in semesters 1, 3, 5, and 7. In addition, Successful Leadership Positions was also significant during semester 5. Likewise, Ting (2000) found differences in the noncognitive variables that were significant in his study of the academic success of Asian American students. His regression analysis explained 26.2% of the variance for fall semester GPA and 31.3% of the variance for spring semester GPA. In regard to noncognitive variables, he found Realistic Self-Appraisal and Successful Leadership Positions to be predictive of first semester GPA; whereas, Realistic Self-Appraisal and Demonstrated Community Service were predictive of GPA during the second semester. Although the populations differed, these studies demonstrate that noncognitive variables vary by semester.

In addition, this study utilized extant data which limited the questions the investigator was able to ask. The investigator would have liked to have considered the impact of integration and involvement but was unable to do so with the existing data. The investigator also had significant difficulty acquiring all the necessary demographic information from the two participating institutions because the institutions provided cumulative demographic data and demographic data for Fall 2003 several times before providing the requested data for Spring 2004. The process of collecting accurate and complete data regarding age, Spring 2004 GPA and Spring 2004 enrollment status took approximately six months.

Implications for Future Research and Practice

Overall, a gap continues in the literature in understanding the value of using both cognitive and noncognitive variables to predict academic success and persistence of African-American students. More research is needed comparing larger samples of students from both PWIs and HBCUs because the type of college environment (predominately African-American or White) may directly affect the psychological and emotional well being of African-American college students as well as their overall academic success (Fleming, 1984; Gurin & Epps, 1975; Washington, 1996). However, the cognitive and noncognitive variables need to be studied apart before examining these variables together. As Tracey and Sedlacek (1980) warned "cognitive and non-cognitive areas must be studied separately, and only when we have relatively reliable and valid measures in each area should we combine them in a research study" (p. 2).

In particular, more research is needed in understanding the interplay between campus integration and both cognitive and noncognitive variables. According to Tinto (1993), students that experience differences in education may develop a variety of noncognitive factors that allow the students to succeed at their chosen college campus. Overall, the findings of this study indicate a need to further examine Tinto's (1993) theory and the noncognitive variables. In order for students to be academically successful and to persist to graduation, the student must successfully integrate into the college campus. The degree of integration will be significantly impacted by the student's pre-existing noncognitive profiles and the significance of the student's noncognitive profiles will be mediated by the degree of integration into the college campus. This interplay between integration and noncognitive variables is an important area for future research.

Likewise, more research is needed to better understand the interplay between involvement variables and both cognitive and noncognitive variables. Astin's Theory of Involvement (1975, 1993) views a student's involvement with the institution as an important key to effective education. Astin (1993) believes that academic persistence in college depends to a great extent on the degree and quality of involvement between the student and the institutional environment. The amount of learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in the program. The degree of student involvement in educational activities and other institutional factors is positively correlated with the degree of learning, knowledge acquisition, and self-development. Overall, campus involvement positively impacts a student's experience in college. For instance, the importance of involvement is supported in the current study by the significant correlation between Demonstrated Community Service and Spring 2004 GPA for the whole sample.

Overall, Astin (1993) identified two critical factors of involvement: (a) the extent to which the student interacts with student peers, and (b) the extent to which students interact with faculty. Much like Tinto (1993), Astin (1993) believed that undergraduates who are actively involved in the college experience with their peers are more likely to obtain positive outcomes. The peer groups having the greatest impact will be those with whom the individual most strongly identifies especially in light of the almost infinite number of possible peer groups in which a student may affiliate with during college. Astin argued that "the magnitude of any peer group effect will be proportional to the individual's frequency and intensity of affiliation or interaction with that group" (p. 402). Astin noted two ways for institutions to facilitate the formation of positive peer groups: (a) to identify common

interests in peers and (b) to provide opportunities for sustained interaction. Therefore, the NCQ could serve as a diagnostic tool for identifying common interests and opportunities for sustained interaction. For instance, in this study, Successful Leadership Positions could explain how African-American students at the PWI were successfully navigating peer relations through the negotiating and influencing skills they acquired in their previous leadership experiences.

Astin's (1993) second factor of involvement is faculty-student interaction which is more the quality of time spent than quantity of time. Astin claimed that involvement with faculty members in and out of the classroom positively influences various cognitive and affective outcomes for college students. For instance, student-faculty interactions strongly correlate with all of the following outcomes: satisfaction with faculty, perception of student-oriented faculty, quality of instruction, individual support services, and the overall college experience (Astin, 1993). And, student-faculty interaction is positively correlated with every academic outcome: college GPA, degree attainment, graduating with honors, and enrollment in graduate or professional school. Again, the NCQ can serve as a diagnostic tool to aid practitioners in identifying opportunities for increasing faculty-student interaction. For example, Sedlacek (2004) discussed one small, selective college who implemented a new advising system in which all students took the NCQ after admission. The faculty and staff specialized in one or more noncognitive variables for which the faculty or staff specialist would offer group or individualized development opportunities for the students based on the students' NCQ results and identified areas of concern. This proactive approach resulted in a significant increase in retention at the school, particularly for nontraditional students. Likewise, Knowledge Acquired in a Field represents innovative or creative knowledge such

as knowing how to study, tools for navigating the academic environment, and developing a study plan. Faculty could utilize the NCQ profile scores to identify students who may need more knowledge in this area, and faculty can provide more quality interaction with the students while providing instruction in these needed areas.

Despite the small amount of variance accounted for by the noncognitive variables in this study, practitioners need to remember that Sternberg (1985) noted that standard measures of intelligence do not fully represent one's intelligence. Instead, measures of experiential and contextual intelligence must also be considered in order to account for the individual's ability to adapt to an environment. Overall, cognitive factors alone, like those measured by the SAT, do not accurately predict academic success and persistence of minority students (Arbona & Novy, 1990; Farver, Sedlacek, & Brooks, 1973; Pfeifer & Sedlacek, 1971; Sample & Seymour, 1971; Temp, 1971; Ting, 2000; Ting & Robinson, 1998). Instead, noncognitive or psychosocial factors should be taken into consideration to accurately predict the academic success and persistence of minority students. In fact, institutions who utilize noncognitive variables in their admissions criteria have been able to admit and retain more traditionally underrepresented students (Sedlacek, 1987).

Practitioners need to consider the influence of noncognitive variables throughout a student's education. As demonstrated in previous research, the influence of noncognitive variables varies across semesters (Tracey & Sedlacek, 1984; 1987; Ting, 2000; Ting & Robinson, 1998). Therefore, as recommended by Ting and Robinson (1998), practitioners should consider developing programs beyond the first semester that will enhance students' noncognitive or psychosocial development and improve both academic success and persistence. In addition, admissions counselors needed to consider nontraditional means of

demonstrating readiness and potential for college. As noted by Allen (1992), the most promising nontraditional students have often shown their leadership ability in a nontraditional manner, such as working in their community or in their church.

HBCUs as well as PWIs can learn from the results of this study. For example, Positive Self-Concept may not be as significant for students attending an HBCU because these students may not have to deal with the dominant culture and have their self-concept challenged. However, HBCUs must consider ways to prepare students for dealing with the dominant culture and identify ways to fortify students' self-concept after graduation. As Dalton (1997) stated HBCUs should "consider how best to handle the preparation of Black students to be successful for the roles they will have to assume in the dominant culture while not completely dismissing their own culture" (p. 94).

Overall, this study provides enough evidence to support further research regarding how and when noncognitive variables differ in predicting academic success and persistence at a PWI versus a HBCU. In particular, future research needs to utilize much larger samples and examine a variety of PWIs and HBCUs to truly assess how the noncognitive variables can assist in admissions and retention and if the significance of the noncognitive variables differs across institution type and by semester. Future research must also consider other noncognitive factors not included in the NCQ which is primarily a pre-college model. For example, we need to examine college process models such as Tinto's (1993) Theory of Integration and Astin's (1993) Theory of Involvement. In addition, other factors such as socioeconomic status, parents' education level, expectations of involvement, and gender were not considered in this study. Likewise, more than one PWI and one HBCU should be included in future longitudinal studies to accurately determine the effect of the noncognitive

variables from entry to graduation and to increase the generalizabilty of future research findings.

In summary, the majority of noncognitive variables did not assist in determining the second semester GPA of African-American students at either the PWI or the HBCU. This was an unexpected finding in light of the preliminary information that was noted during the initial coding of the qualitative portion of the NCQ for the PWI and HBCU. In addition, previous research had documented the value of using noncognitive variables, and specifically the NCQ, to predict the academic success and persistence of students who are a minority in their educational settings. However, research has clearly demonstrated that the significance of noncognitive variables varies from semester to semester. Therefore, a more comprehensive longitudinal study is needed to fully understand what, if any, differences there are in the way noncognitive variables predict academic success and persistence at a PWI versus a HBCU.

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APPENDICES

APPENDIX A

North Carolina State University
INFORMED CONSENT FORM for RESEARCH

We are asking you to participate in a research study. The purpose of this study is to find out the factors affecting college student development and performance. The study will last for four years, starting from August, 2003 to July of 2007.

INFORMATION
If you agree to participate in this study, in fall of 2003 you will be asked to respond to a questionnaire in your class, which takes about 20 to 30 minutes to complete. The survey questions will ask you how you feel about yourself and expectations on university experience. You are also asked to consent to access to information about your continuing enrollment and academic records.

RISKS
It involves a potential of minimal psychological risks only. If you feel discomfort and need any counseling or psychological services, you are encouraged to contact the Counseling Center on campus, phone number is 919-515-2423.

BENEFITS
The results of the study will be useful for improving college student services and admissions. As participants, you will understand your self better and your expectations about college experiences.

CONFIDENTIALITY
The information in the study records will be kept strictly confidential. Data will be stored securely in a locked office, which only the principal investigator and his research assistants has access. No reference will be made in oral or written reports which could link you to the study.

COMPENSATION
There is no compensation for you for participating in this study.

CONTACT
If you have questions at any time about the study or the procedures, you may contact the researcher, Dr. S. Raymond Ting, at 919- 515-6362. If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Dr. Matthew Zingraff, Chair of the NCSU IRB for the Use of Human Subjects in Research Committee, Box 7514, NCSU Campus (919/513-1834) or Mr. Matthew Ronning, Assistant Vice Chancellor, Research Administration, Box 7514, NCSU Campus (919/513-2148)

PARTICIPATION
Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will be returned to you or destroyed at your request.

CONSENT
"I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may withdraw at any time."

Student's signature_____ **Date** _____

Student's name: _____ **Social security number:** _____

Investigator's signature_____ **Date** _____

APPENDIX B

NC A&T
Consent Form

This study intends to investigate factors affecting college life and student development. This is a joint study of a consortium of five universities including the North Carolina A&T University. Permission is obtained from the NC A&T University to conduct this survey. The results of the study will help improve student admissions, academic and other student services. In this questionnaire, there is no psychological or social risk that may affect you. The results will be reported for groups only; no individuals will be identified. This study is voluntary. If you want to withdraw from the study at any time, you may do so without any penalty. By signing this form you consent to participate in this study and to a review of your academic record. If you have any comments or questions, please contact the principal researcher: Dr. S. Raymond Ting at the Department of Educational Research and Leadership and Counselor Education, 520 Poe Hall, Box 7801, NC State University; phone: 919-515-6362, e-mail: raymond_ting@ncsu.edu

Print your name: _____

Social Security Number:_____

Signature: _____ Date:_____

APPENDIX C

Noncognitive Questionnaire – Revised (NC State version)

Part I

The NC State University is investigating factors affecting college life and student development. This is a joint study of a consortium of five universities. Data will be reported for groups only; no individual will be identified. Please answer the following items 1 to 4 on this sheet. Then respond to items 5 to 47 by marking your answer with a No. 2 pencil on the separate multiple choice answer sheet.

1. Please list three things that you are proud of having done;

(1).

(2).

(3).

2. Please list three goals that you have for yourself right now;

(1).

(2).

(3).

3. Please list office held and/or groups belonged to in high school or in your community.

_____ _____

_____ _____

4. In America, about 50% of university students typically leave before receiving a degree. If this should happen to you, what would be the most likely cause (Circle one answer only)?
    1. Absolutely certain that I will obtain a degree
    2. To accept a good job
    3. To enter military service
    4. It would cost more than my family could afford
    5. Marriage
    6. Disinterest in study
    7. Lack of academic ability
    8. Insufficient reading or study skills
    9. Others

Part II:

For items 5 to 47, please mark your answer with No. 2 pencils on the multiple choice answer sheet. Before you answer, first fill in your social security number under the "identification number" box and darken the corresponding space with pencils. Please do not mark on this questionnaire.

5. Your sex is:
   A. Male
   B. Female

6. Your race/ethnicity is:
   A. African American
   B. Asian American
   C. Caucasian (not of Hispanic origin)
   D. Hispanic
   E. Native American

7. Your father's education level:
   A. High school or high school diploma
   B. College, but less than a bachelor degree
   C. B.A. or equivalent
   D. 1 or 2 years graduate or professional education (master's degree)
   E. Doctoral degree such as M.D., Ph.D., etc.

8. Your mother's education level is:
   A. High school or high school diploma
   B. College, but less than a bachelor degree
   C. B.A. or equivalent
   D. 1 or 2 years graduate or professional education (master's degree)
   E. Doctoral degree such as M.D., Ph.D., etc.

9. I plan to live A. on-campus or B. off-campus in the first-year of my college study.

10. I plan to enroll/enrolled ____ credits (usually a course is 3 credits) in the first semester.
   A. 0-6
   B. 7-11
   C. 12-18
   D. 19-21
   E. more than 21

11. I expect to study _____ for my class (on assignments, papers, preparing for classes, etc)
    A. 1-5
    B. 6-10
    C. 11-15 hours per week
    D. 16-20
    E. 21 or more

12. I expect to work on- or off-campus for ____ hours per week.
    A. 0
    B. 1-10
    C. 11-20
    D. 21-30
    E. 31 or more

13. I expect to feel _____for my learning/academic experiences here in the first year.
    A. Very satisfied
    B. Satisfied
    C. Not sure
    D. Unsatisfied
    E. Very unsatisfied.

14. I expect to feel _____for my social life here in the first year.
    A. Very satisfied
    B. Satisfied
    C. Not sure
    D. Unsatisfied
    E. Very unsatisfied.

15. I expect to spend _____hours per week in participating in campus activities here in the first year.
    A. 0
    B. 1-2
    C. 3-5
    D. 6-9
    E. 10 or more

16. How much education do you expect to get during your lifetime?
    A. College, but less than a bachelor's degree
    B. B.A. or equivalent
    C. 1 or 2 years of graduate or professional study (master's degree)
    D. Doctoral degree such as M.D., Ph.D., etc.

For items 17-34 use the following to indicate the extent to which you agree or disagree with each of the following items. Respond to the statements below with your feelings at present or with your expectations of how things will be.

1	2	3	4	5
A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

17. The university should use its influence to improve social conditions in the community.

18. It should not be very hard to get a B (3.0) average at NC State.

19. I get easily discouraged when I try to do something and it doesn't work.

20. I am sometimes looked up to by others.

21. If I run into problems concerning school, I have someone who would listen to me and help me.

22. There is no use in doing things for people, you only find that they will not do anything good for you.

23. In groups where I am comfortable, I am often looked to as leader.

24. I expect to have a harder time than most students at NC State.

25. Once I start something, I finish it.

26. When I believe strongly in something, I act on it.

27. I am as skilled academically as the average students of NC State.

28. I expect I will encounter racism at NC State.

29. People can pretty easily change me even though I thought my mind was already made up on the subject.

30. My friends and relatives don't feel I should go to college.

31. My family always wanted me to go to college.

32. If course tutoring is made available on campus at no cost, I would attend regularly.

33. I want a chance to prove myself academically.

34. My high school grades don't really reflect what I can do.

APPENDIX D

REVISED SCORING KEY FOR SUPPLEMENTARY ADMISSIONS QUESTIONNAIRE II (NC State version)

QUESTIONNAIRE ITEMS		VARIABLE NAME (NUMBER) Option 1 = 1; 2 = 2; 3 = 3; 4 = 4; No response = 2
1		Use to score for Self Concept (I) Each accomplishment is coded according to this scheme:
	1 =	at least 75% of applicants to your school could have accomplished it (e.g., "graduated from high school," "held a part-time summer job")
	2 =	at least 50% of applicants to your school could have accomplished it (e.g., played on an intramural sports team," "was a member of a school club")
	3 =	only top 25% of applicants to your school could have accomplished it (e.g., "won an academic award," "was captain of football team")
2	A.	Options for Long Range Goals (IV) Each goal is coded according to this scheme:
	1 =	a vague and/or immediate, short-term goal (e.g., "to meet people," "to get a good schedule," "to gain self confidence")
	2 =	a specific goal with a stated future orientation which could be accomplished during undergraduate study (e.g., "to join a sorority so I can meet more people," "to get a good schedule so I can get

good grades in the fall," "to run for a student government office")

3 = a specific goal with a stated future orientation which would occur after undergraduate study (e.g., "to get a good schedule so I can get the classes I need for graduate school;" "to become president of a Fortune 500 company")

2 B. Options for Knowledge Acquired in a Field (VIII)
Each goal is coded according to this scheme:

1 = not at all academically or school related; vague or unclear (e.g., "to get married," "to do better," "to become a better person")

2 = school related, but not necessarily or primarily educationally oriented (e.g., "to join a fraternity," "to become student body president")

3 = directly related to education (e.g., "to get a 3.5 GPA," "to get to know my teachers")

Find the mean for each dimension (e.g. Long Range Goals) and round to the nearest whole number.

3 Use to score for Leadership (VI), Community Service (VII) and Knowledge Acquired in a Field (VIII). Each organization is given a code for A, B, and C below.
Find the mean for each dimension (e.g. Leadership) and round to the nearest whole number.

3 A. Leadership (VI)

1 = ambiguous group or no clear reference to activity performed (e.g., "helped in school")

2 = indicates membership but no formal or implied leadership role; it has to be clear that it's a functioning group and, unless the criteria are met for a score of "3" as described below, all groups should be coded as "2" even if you, as the rater, are not familiar with the group (e.g., "Fashionettes, " "was part of a group that worked on community service projects through my church")

3 = leadership was required to fulfill role in group (e.g., officer or implied initiator, organizer, or founder) or entrance into the group was dependent upon prior leadership (e.g., "organized a tutoring group for underprivileged children in my community," "student council")

3 B. Community Service Relatedness (VII)

1 = no community service performed by group, or vague or unclear in relation to community service (e.g., "basketball team").

2 = some community service involved but it is not the primary purpose of the group (e.g., "Scouts")

3 = group's main purpose is community service (e.g., "Big Brothers/Big Sisters")

3 C. Knowledge Acquired in a Field (VIII) (same coding criteria as used for item 8B.)

4 Use to score for Self-Concept (I) and Self-Appraisal (II)
Option 1 = 4; 2 through 9 = 2; No response = 2

Find the mean code for each dimension and round to the nearest whole number.

For items 17 through 34, positive (+) items are scored as is. Negative (-) items are reversed, so that 1 = 5, 2 = 4, 3 = 3, 4 = 2, and 5 = 1. A shortcut is to subtract all negative item responses from 6.

QUESTIONNAIRE ITEMS	DIRECTION	VARIABLE NAME (NUMBER)
17	-	Use to score for Racism (III)
18	-	Use to score for Realistic Self-Appraisal (II)
19	+	Use to score for Long-Range Goals (IV)
20	-	Use to score for Leadership (VI)
21	-	Use to score for Availability of Strong Support (V)
22	+	Use to score for Community Service (VII)
23	-	Use to score for Leadership (VI)
24	+	Use to score for Racism (III)
25	-	Use to score for Long-Range Goals (IV)
26	-	Use to score for Positive Self-Concept (I)
27	-	Use to score for Realistic Self-Appraisal (II)
28	-	Use to score for Racism (III)
29	+	Use to score for Positive Self Concept (I)

30	+	Use to score for Availability of Strong Support (V)
31	-	Use to score for Availability of Strong Support (V)
32	-	Use to score for Racism (III)
33	-	Use to score for Racism (III)
34	-	Use to score for Positive Self Concept (I)

SUPPLEMENTARY ADMISSIONS QUESTIONNAIRE II
Worksheet for Scoring

1. POSITIVE SELF-CONCEPT OR CONFIDENCE
   item16* + item4* + item1* + (6 – item26) + item29 + (6 – item34)

2. REALISTIC SELF-APPRAISAL
   item4* + (6 – item18) + (6 - item27)

3. UNDERSTANDS and DEALS with RACISM
   (6 – item17) + item24 + (6 – item28) + (6 – item32) + (6 – item33)

4. PREFERENCE FOR LONG-RANGE GOALS to SHORT-TERM or IMMEDIATE NEEDS
   item2A* + item19 + (6 – item25)

5. AVAILABILITY of a STRONG SUPPORT PERSON
   (6 – item21) + item30 + (6 – item31)

6. SUCCESSFUL LEADERSHIP EXPERIENCE

(6 – item20) + (6 – item23) + item3A*

7. DEMONSTRATED COMMUNITY SERVICE
item22 + item3B*

8. KNOWLEDGE ACQUIRED in a FIELD
item2B* + item3C*

* Recoded item. See scoring instructions for these items on pages 1-3 herein.

Adapted from Sedlacek, W.E. (1990). *Scoring key for Supplementary Admissions Questionnaire II.* Retrieved September 13, 2002, from University of Maryland, Diversity Database: http://www.inform.umd.edu/EdRes/Topic/Diversity/General/Reading/Sedlacek/ncqskey.html